VOLVME VIII MARCH 1899 No. 3

THE BRICKBVILDER

OFFICE 85 WATER STREET BOSTON

THE BRICKBUILDER.

AN ILLUSTRATED MONTHLY DEVOTED TO THE ADVANCEMENT OF ARCHITECTURE IN MATERIALS OF CLAY.

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THE WINDSOR HOTEL FIRE.

WE seem to be having more than our share of experience this year. The fire in the Windsor Hotel, New York, is one of those regrettable features of modern civilization for which it is hard to find any excuse. There is no good reason why structures of that sort should be tolerated at all in any community. It requires no special constructive knowledge to appreciate that the hotel was a mere fire-trap, and that it would go like a flash if fire once got started. The various stories which have appeared in the papers hinting at a possible incendiary origin are by no means necessary to satisfactorily account for the origin of so destructive a conflagration. The building itself was all ripe for ruin, and the conditions have been exactly the same for years. The so-called fire precautions in the way of standpipes or sprinkler service when installed in a structure of that character would be of doubtful efficiency in saving the building or in preventing loss of life. We had occasion a short time since to examine a hotel which was in process of demolition, after having been occupied for a period of sixty or seventy years. During that time the floors had probably never been wet down, and we found the beams and the interior woodwork generally in such a highly inflammable condition that it would not have needed the efforts of an incendiary to set the whole ablaze in a twinkling. The wooden floor beams of the Windsor were undoubtedly in the same condition, and once the fire got in between the timbers there was no hope for the structure, while with the antiquated arrangements of stairs, fire escapes, and the absurdly inadequate dependence upon ropes for means of fire escape, the fate of a good many of the tenants was a foregone conclusion.

A catastrophe of this description sets every one to thinking, especially every one who lives in or even casually occupies a hotel. Whether this suggested thought will crystallize into any action tending to lessen the liability of such danger for the future is a conundrum which will probably have to be answered in the negative. Vested interests are hard to molest, and when one thinks of the number of hotels built on exactly the same principle as the Windsor and every bit as dangerous in case of fire, and how utterly impracticable it is to make these hotels over as they ought to be made, one can easily appreciate that we are likely to have repetitions of exactly the same horror. The danger to be guarded against is not from hotels which may be built in the future, — that is locking the stable door after the horse has been stolen. There is no question about what constitutes good construction nowadays. We may not be able to build a hotel which is absolutely fire-proof, but we certainly can build a structure wherein nothing but the contents can be consumed, and wherein the fire can be localized so effectually that the danger to life if not to property is very slight. Our laws relating to new structures are in thoroughly good shape, and the danger from future hotels or from hotels which have been built within the last few years is not to be feared. It is from the old hotels, which cannot be reached by existing laws, which grow worse every year, and in which the chances of carelessness resulting in disaster are yearly becoming larger, that we are to apprehend the most serious danger. There have been at times spasmodic attempts to remedy this manifest incongruity of our modern civilization. The city of Boston some years ago had a very admirable law to the effect that whenever any existing hotel building was added to or altered the whole structure, including both old and new, should be made thoroughly fire-proof. This was a practical prohibition of adding to or alteration of existing hotels, which was precisely what was intended by the law, the evident hope being that by discouraging alterations to old buildings the owners would be encouraged to tear them down entirely and build new. The property interests, however, were too great and the law was repealed. So far as we know, the provision was never applied to any hotel, and as a result thereof we have to-day in this city one hotel in which a fire would result in far greater catastrophe than was the case in the Windsor, a hotel which would go like a flash, and in which the occupants, even in broad daylight and with no confusion, are not always sure of finding their way out straight. Besides this, there are other hotels of less note which would undoubtedly be totally destroyed by a chance fire. Indeed, so far as we know, there is only one of the down-town transient hotels in this city which can fairly be called fire-proof. Nor is the condition in any of our large cities very much better. We trust to luck and the insurance company instead of compelling our property owners to build in such manner that a building cannot be entirely destroyed, and then when a fire like the Windsor occurs we can only shudder and regret.

In this connection we want to call attention to the absurdity of some of the building laws which make the height of a building a measure of the degree to which it should be fire-proofed. Just as though a four-story building could not burn down as easily as a fourteen! As a matter of fact the Windsor was not a very high

building, as high buildings go nowadays, and yet in several of our cities fire-proof construction is not mandatory for constructions of this sort if kept below a certain limit of height. We believe the time is coming when a wise public policy will demand that not merely hotels or apartments houses, but structures of every sort in the heart of a large city, shall be constructed on the principles of so-called fire-proof construction; when good brick and good terra-cotta will be depended upon rather than insurance policies and hazards of fate; and when the rights of all will be considered rather than the rights of the few who have inherited estates covered with inflammable structures.

PERSONAL, CLUB, AND SUNDRY NEWS ITEMS.

M. R. BURROWES, architect, has opened an office at Sarnia, Ontario.

W. G. ECKLES, architect, has opened an office in the Citizens' Bank Block, New Castle, Pa.

KURT W. PEUCKERT, architect, Philadelphia, has removed his office to 259 South 4th Street.

ARTHUR PEABODY and William Jean Beauley, architects, have formed a copartnership, with offices at 1649–50–51 Monadnock Building, Chicago.

LOUIS MULLGARDT and J. Morrison Dunham, architects, St. Louis, Mo., have formed a copartnership, under firm name of Mullgardt & Dunham, offices 415 Commercial Building, St. Louis, Mo.

"MUNICIPAL RECONSTRUCTION," a lecture illustrated by lantern slides from original drawings and photographs, was delivered before the Civic Club, of Philadelphia, on Saturday, March 4, by Mr. Albert Kelsey.

THE Brooklyn chapter of the American Institute of Architects, on the evening of March 15, gave a luncheon and press view of its forthcoming architectural exhibition, which is to be held at the Brooklyn Museum of Arts and Sciences.

AT the regular monthly meeting of the T Square Club, held on February 15, the subject for competition was a gentleman's stable for a country place. Before the criticism began, Mr. Wm. M. Baily, of Baily & Truscott, gave an illustrated lecture upon the subject.

The result of competition was as follows: First mention, Wetherill P. Trout; second, B. Edward Hill; third, Alfred Morten Githens.

THE 523d regular meeting of the Society of Arts was held at the Massachusetts Institute of Technology, on Thursday, March 9. Mr. Theodore H. Skinner, S. B., '92, superintendent of construction at the University of Virginia, for McKim, Mead & White, presented a paper on "The Construction of the University of Virginia, Old and New." Views of the original plans made by Thomas Jefferson, with the buildings as formerly constructed and now rebuilt and extended, were shown on the curtain, and a full description given of the unusual structural problems involved.

THE interesting events of recent date at the Chicago Architectural Club are as follows: Monday evening, February 20, Mr. J. H. Vanderpoel addressed the club on "Reminiscences of a Trip Through Holland." Monday evening, February 27, a comedy by Mr. E. C. Hemmings, a member of the club, entitled "The New Draughtsman," was given. Monday evening, March 6, Mr. Frank L. Wright addressed the club on the "Practical Nature of the Artistic." Monday evening, March 13, Mr. James R. Willett addressed the club on "Heating and Ventilation." Monday evening, March 20, Mr. John K. Allen addressed the club on "A Trip Through Norway."

THE regular dinner and meeting of the Society of Beaux-Arts Architects was held on February 20, at Flouret's, 18th Street and Fifth Avenue, and was exceptionally well attended, forty members and guests being present, including several from Boston and Philadelphia.

Under the head of new business Mr. Charles Morris introduced the following resolutions: —

Whereas, The Society of Beaux-Arts Architects fully appreciates Secretary Gage's public-spirited enforcement and wise application of the Tarsney Act, and the splendid results which are now being obtained under the same by Mr. James Knox Taylor, Supervising Architect of the Treasury, in his endeavor to elevate the standard of artistic merit of the United States Government buildings;

Resolved, That in the judgment of this society it is much to be desired that the rules of competitions established by the Supervising Architect's office, especially for important buildings, such as the proposed New York Custom House, should be instituted so as to permit of the participation in those competitions by the largest possible number of competitors, as was the case under conditions generally regarded as most satisfactory in the competition for the New York Public Library;

Resolved, That the Society of Beaux-Arts Architects hereby petition the Supervising Architect, and through him the Secretary of the Treasury, to modify the rules governing competitions for United States Government buildings in such a manner as to permit of the accomplishment of the above object.

THE Boston Architectural Club will conduct an architectural exhibition at the St. Botolph Club, 2 Newbury Street, Boston, from May 15 to May 27, 1899, inclusive. Contributions not previously exhibited in Boston are requested. Drawings, models, and photographs of architectural and landscape design, drawings, models, photographs, and examples of executed work in mural decorations, mosaic, stained glass, interior decoration and furniture, wood and stone carving, metal work, and the applied arts generally will be received, subject to the approval of the jury of admission. The committee are especially desirous of exhibiting photographs of executed work accompanied by plans.

Drawings should be marked "For the B. A. C. Exhibition," and sent either to the Boston Architectural Club, 5 Tremont Place, Boston, Mass., or to the agents in New York or Philadelphia, on or before the date of collection in these cities. Drawings from the League Exhibition which go on to Chicago or St. Louis will, subject to the consent of the exhibitors, be forwarded to Boston and returned from there without expense to exhibitors, or can be sent direct from League Exhibition.

Collections will be made in Boston on Friday, April 28; in New York, by Messrs. W. S. Budworth & Son, agents, 424 West 52d Street, on Wednesday, April 26; in Philadelphia, by Messrs. James S. Earle & Sons, 816 Chestnut Street, on Tuesday, April 25.

Contributions must be received on or before May 1, 1899.

Each work must bear a label giving its title, the name and address of the exhibitor, and explicit directions for its return.

All drawings and photographs must be framed.

Entry blanks properly filled out must be sent on or before May 1, 1899, to the Exhibition Committee of the Boston Architectural Club, 19 Exchange Place, Boston, Mass.

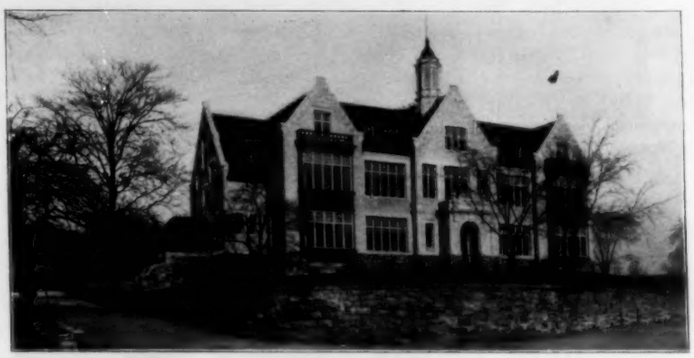
Special Exhibition Committee: George E. Barton, chairman; R. Clipston Sturgis, Irving T. Guild, Albert Chapman Fernald, and J. Randolph Coolidge, Jr., of the Boston Society of Architects; Richard Howland Hunt, of New York; Wilson Eyre, Jr., of Philadelphia.

The American Schoolhouse. XVI.

BY EDMUND M. WHEELWRIGHT.

THE writer would say that when he has criticized the lighting of class rooms 28 ft. wide with windows upon one side only, that such criticism can be made concerning every schoolhouse which he has designed. The responsibility for this particular defect in American schoolhouse construction does not rest with the architects. It is the result of conditions imposed by school boards.

In the last month's consideration of the Newark High School the writer spoke of the class rooms of that building, all of which were lighted from one side only, as "apparently 28 ft. wide," and stated that with such width these rooms could not be adequately lighted. The plan of this building, which was before the writer, was a reproduction of a drawing upon which the sizes of rooms were not given, and assuming that the rooms were 32 ft. long, it appeared that the width was 28 ft.

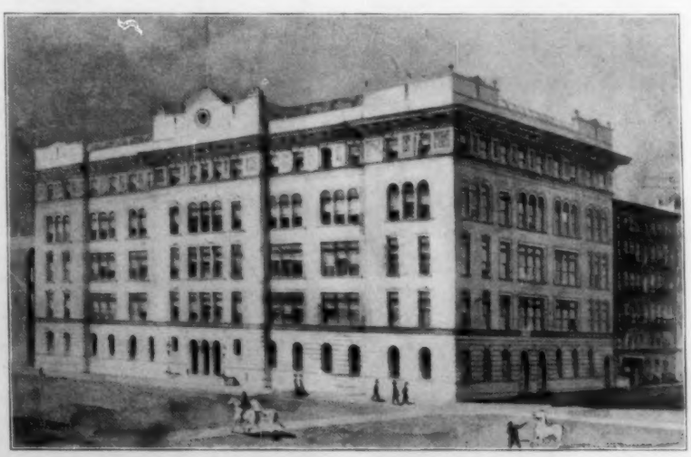


PUBLIC SCHOOL NO. 153, NEW YORK CITY.
C. B. J. Snyder, Architect.

The architects of the building write that these rooms are but 23 ft. wide, and the writer is glad to correct his error and to commend this notable step towards the scientific lighting of schoolrooms.

The writer was again misled by the reproduction of the plan in regard to the out-door clothing disposal adopted in the Newark school. Certain lines which appeared to be in the reproduction representative of partitions, he now sees are the letters "cloak room," and in addition to the large cloak rooms provided in the basement there is adjoining each class room a "wardrobe," provided with two doors from the class room, but with no door to the corridor. Each of these wardrobes has outside light.

The writer prefers for the out-door clothing disposal in high school individual lockers in large rooms of the basement, but he recognizes the arrangement shown in the Newark school as preferable to the grammar school wardrobe so often found in high schools, a feature which is designed to meet the requirements of discipline of a graded school, and which is not nicely adapted to the requirements of a high school.



PUBLIC SCHOOL NO. 20, NEW YORK CITY.
C. B. J. Snyder, Architect.

Until within the past few years the public schoolhouses of New York City have offered few, if any, worthy examples of such buildings; but within a comparatively short time this condition has been changed to a marked degree. Under the present superintendent of school buildings of New York, radical and interesting innovations in schoolhouse architecture have appeared in that city. These may be briefly described by the following quotations from a letter of Mr. C. B. J. Snyder, the architect of these buildings: —

It must be admitted that the conditions which we have to confront here in New York are entirely different from those presented by any other city in this or any other country. The density of population and the number of children coming from the blocks and acres of five-story, four-family tenements in various parts of the city is simply appalling. School buildings accommodating 2,500 children are numerous in the lower East Side, but new ones are being erected all the time, and yet there is a demand for further accommodations. That this population is somewhat cosmopolitan can be judged from the fact that frequently twenty and more languages and dialects have been represented in one class of the lowest grade, 50 per cent. of which could not speak a word of English beyond the words "yes" or "all right," "no" being usually a scowl and shrug or a scream.

These conditions, which are without parallel, beget large buildings, especially since it has not been unusual to expend $250,000 to $300,000 for a plot of ground, of say 20,000 sq. ft., secured not by purchase, but through condemnation proceedings, conducted by commissioners appointed by the Supreme Court. Such large cost, as well as the limited area of the block fronts, precludes the possibility of allowing one inch of ground area to go to waste; indeed, it is almost the same problem as an office building where the fronts must be placed on the building line and land being only reserved at the rear to insure light. Even this at times has been most difficult where the plots are only 100 ft. deep, while the building of necessity must occupy 62 to 65 ft. of this depth.

That such districts are not slighted in the kind of buildings can be seen by the cut of Public School No. 20. All buildings now being erected, one story or more in height, are of fire-proof construction. Those of four stories and more are of the steel "skeleton" type used in office building and other work, the adoption of the system being due to the building laws, which exact certain thicknesses of wall over and above a specified amount for every 10 per cent. or fraction thereof in which the openings in a bearing wall exceed 25 per cent. of its area.

As our window frames are usually 10 ft. 6 ins., or 11 ft. by

16 ft., or 17 ft. 6 ins., our walls would be 36 ins. or so in thickness in the first story, instead of the 16 ins. permissible under the steel "skeleton" type of construction. I believe that a schoolroom should be lighted from one single source of light stretching as nearly as may be from the rear to within 4 ft. or so of the front of the room at the left side of the pupils, and not by a series of windows alternating with brick or stone piers, which means light and shadow for each alternate 4 or 5 ft., hence cross lights.

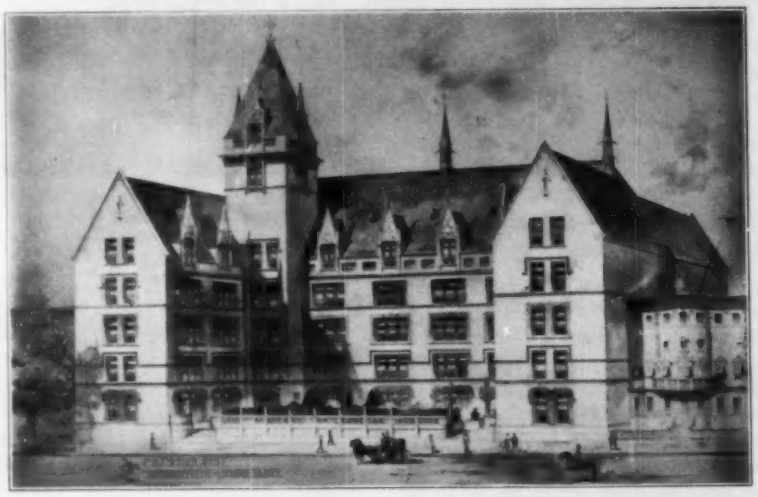
Your published work would not indicate that we are agreed on this point, but I trust you will kindly admit of an honest difference of opinion, as it occurs to me that you have not had to meet such hard conditions as we have in striving to properly light a room from one side only, it not being possible to have corner rooms but in a few instances.

Photographs are sent of Public School No. 165, the first-story plan showing indoor play room and outside play courts, and second story plan, which shows the typical arrangement and design of all buildings of this type. Girls' high school, plans and perspective of which are sent, is also of this type of schoolhouse plan.

This H type of building has been designed to meet the needs when avenue property is expensive and the traffic so great, either by trolley, elevated, or otherwise, as to render it practically impossible to open the windows at any time, and in fact to hear with the windows closed.

It must be borne in mind that all our blocks are about 200 ft. in depth from street to street and about 600 ft. between the avenues. Ground being costly and there being often stables, horseshoe shops, factories, etc., in the near neighborhood, the plan provides for a blank wall on the party line, excepting a slight recess at the center of the block, which is seldom built across by the adjoining owners. All noise and nuisance are cut off, while good clean available spaces are provided by the courts fronting on the streets, which have also an evident advantage of improved light and air. The height of our class rooms is 14 ft. 3½ ins. in the clear. The tops of the windows are within 6½ ins. of the ceiling.

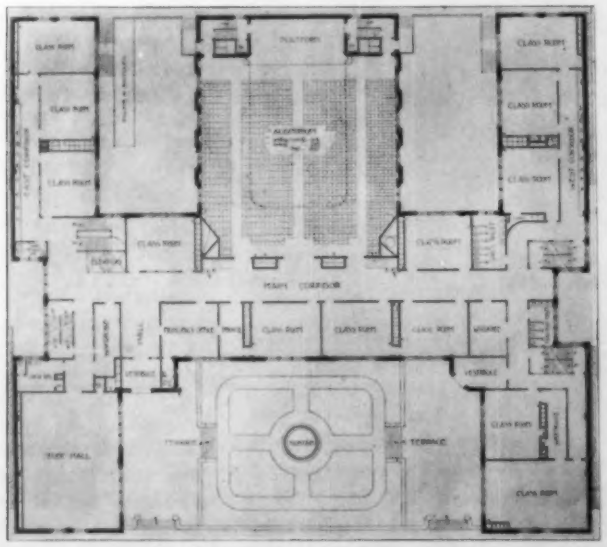
In each of these buildings, the cellar, which is below grade, is given over entirely to the heating and ventilating apparatus, for as we must build on our party lines, we must, in order to protect ourselves, excavate and carry our walls to a depth of at least 11 ft. below curb, and as the sentiment here is opposed to basement play rooms, even one step below grade, we are obliged in most cases to give over the entire first story for an indoor play room, which is paved with asphalt and wainscoted with glazed brick 5 ft. 6 ins. high, and lighted so as to be used for evening lectures, for which portable seatings are provided. Occasionally a quiet corner of the first floor is set aside for a kindergarten. The second, third, and fourth stories are divided into class rooms, six or eight of which are arranged by means of sliding doors as to admit of their being used as an assembly room, as is shown in second-floor plan of Public School No. 165.



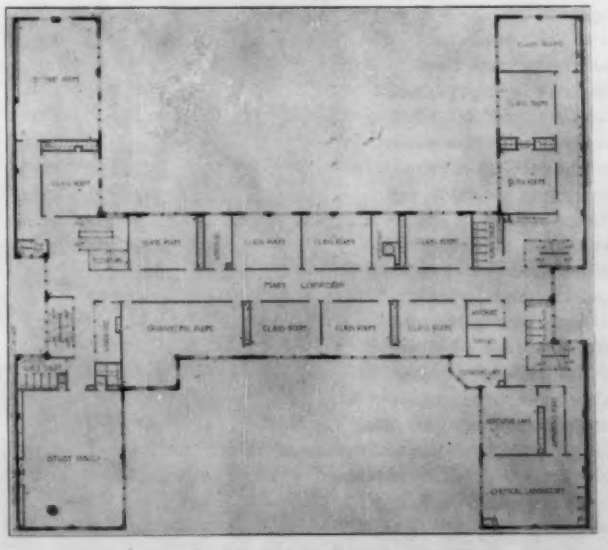
GIRLS' HIGH SCHOOL, 58TH STREET AND 10TH AVENUE, NEW YORK CITY.
C. B. J. Snyder, Architect.

This we are obliged to do, as property is so expensive we cannot afford to form an assembly room which cannot be used for any other purpose.

The fifth story is given over to manual and physical training, cooking room, and a gymnasium. In each of the examples here cited, the high-pitched roofs are utilized for obtaining head room for the gymnasiums and other rooms, the space above being devoted to the necessary vent flues. The fifth stories also afford accommodations for clay model-



FIRST FLOOR PLAN.



THIRD FLOOR PLAN.

GIRLS' HIGH SCHOOL, NEW YORK CITY.

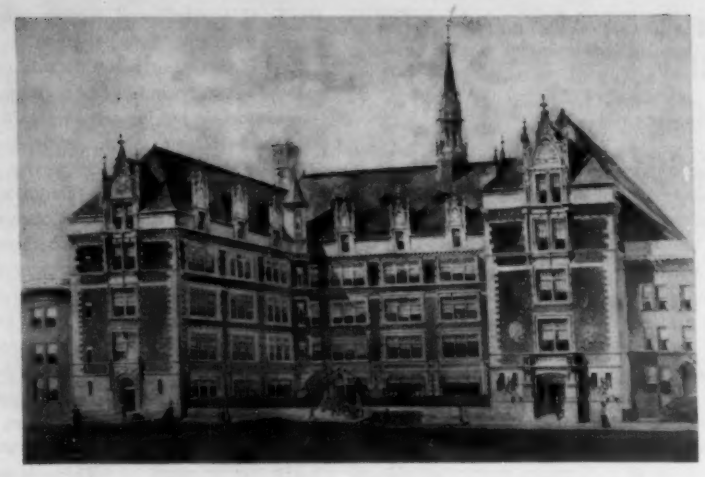
ing, sewing rooms, and a large library. Toilet accommodations are provided in abundance on the first and fifth stories, with a limited number on the intermediate floors.

The smallest building we have yet been called upon to erect is Public School No. 153, which is, however, fireproof throughout.

The heating and ventilation of all our buildings is by steam or hot water, engines and blowers of a capacity sufficient to supply 30 cu. ft. of fresh air per occupant per minute.

All desks and seats are of the single adjustable type.

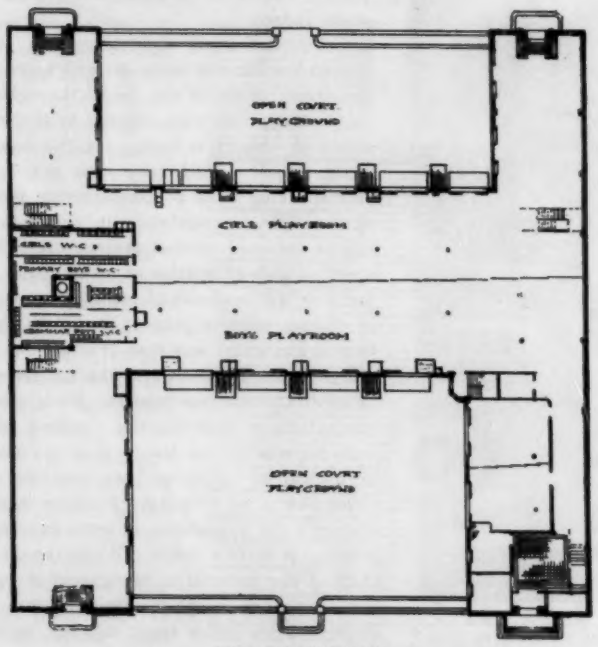
All work is let through



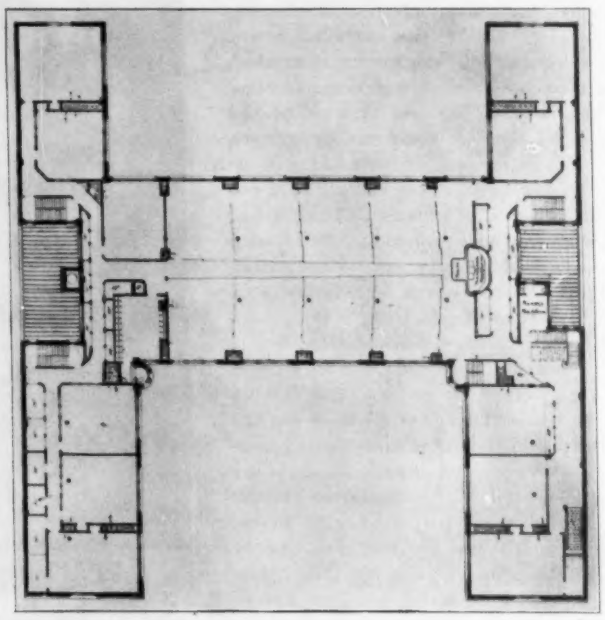
PUBLIC SCHOOL NO. 165, NEW YORK CITY.
C. B. J. Snyder, Architect.

rooms; the fifth for manual and physical training, and in some cases the roof for a playground.

Therefore, in the case of the last-named school, which covers on the second-story line 15,480 sq. ft., has 48 class rooms, physical and manual training rooms, and roof playground, the cost of which, without heating and ventilation, excepting the galvanized iron ducts, and exclusive also of the furniture, was $253,942, *i.e.* 15¾ cents per cubic foot, the cost per class room figured at 48 would be $5,707, while at 48, plus one third, would be $3,968, without deducting anything for



FIRST FLOOR PLAN.



SECOND FLOOR PLAN.

PUBLIC SCHOOL NO. 165, NEW YORK CITY.

public advertisement of two weeks, the contract being awarded to the lowest responsible bidder. Ten sets of ¼ in. scale plans, complete details, and three hundred copies of printed specifications are provided prior to advertisement of a job, and absolutely no drawings are made after the contract is awarded, the number of sheets of details running at times to over one hundred for one building.

I hold that the only correct method of estimating is on the basis of cubical area. In making our calculations all figures are taken from the level of the cellar floor, which averages 11 ft. below grade, although the footings are generally 15 ft., and in the case of School No. 154, St. Ann's Avenue, they were 32 ft. below grade for two thirds of the building.

In comparing the number of class rooms with the cost, consideration must be had of the fact that the entire fifth story of each building is devoted to manual and physical training purposes, and in order to obtain the true cost per class room, the total cost should be divided by the number of rooms given, plus one third, since the cellar is never used but for the heating plant; the first story only for an indoor play room; the second, third, and fourth stories for class the cost of first story or roof playground. Further costs are as follows:—

School No.	Location.	Class rooms.	Cost per cubic foot.	Cost.	
20	Rivington, Forsythe, and Eldridge Sts.	48	$ .15¾	$253,942	Manual and physical training rooms, roof playground.
154	147th St. and St. Ann's Ave.	48	.17¾	253,000	Manual and physical training rooms, foundations 32 ft. deep.
159	119th and 120th Sts. near Third Ave	48	.16	307,000	Manual and physical training rooms, H type.
166	89th St. near Amsterdam Ave.	35	.18	233,000	Manual and physical training rooms, cellar excavated in solid rock from above grade line.

The contracts for two buildings on the H plan have been let recently. They provide for 48 class rooms, etc., and the cost per cubic foot for the one last put under contract was 15 $\frac{6}{10}$ cents per cubic foot.

Space does not permit the writer to comment on the foregoing in this issue. Such comment will be given in the April article, which will be the last of this series.

Church Architecture in Materials of Clay.

BY THOMAS CUSACK.

IN the opening paper of this series we gave some account of two churches in which the Gothic revival of sixty years ago was coincident with the revived use of burned clay as a constructive building material. The style chosen for one of them belonged to an early, and for the other to a later, period in the fourteenth century, thus affording the architect a wide range wherein to test the possibilities of this plastic medium in which he afterwards had reason to repose unfaltering confidence. In the former he had, in addition to many items of a peculiarly exacting character, long stretches of open parapet, and that wonderful spire of pierced curvilinear tracery — in itself a truly remarkable piece of self-supporting terra-cotta construction, with a test of fifty-five years to its credit. In the latter case, he constructed a tower and spire 170 ft. high, supported and embellished by flying buttresses springing from an embattled parapet. He did not shrink from the introduction of clustered shafts, floriated capitals, and five-light windows filled with flowing tracery, all of which were executed without stint or compromise. The difficulties incident to work of this character were not discovered by accident, or, as often happens, after he had gone too far to turn back. They had all been discounted before his arduous undertaking had been entered upon; for, in addition to being a man of wide practical experience in building, Mr. Sharpe was a high authority on every phase of Gothic, from its earliest appearance to its latest development.

An American architect of much promise and some creditable performances in other styles of work favored us a year or two ago with some thoughtful remarks on the principles of terra-cotta treatment. In one of the less thoughtful, he questioned the applicability of that material to "English Gothic architecture." We did not have time to reason this point with him just then, but as he is a diligent reader of THE BRICKBUILDER, we may now be able to dispel his misgivings through that medium. To this end we would merely refer him to the foregoing recital of accomplished facts, in opposition to the cursory expression of a necessarily theoretic opinion. The term "English Gothic," though a very palpable, is likewise a very comprehensive one, therefore a somewhat ambiguous expression. It would include everything from the simplicity of Salisbury to the fan-tracery of Henry VII.'s Chapel, and onward to the end of the Tudor period, not to mention the changes that have been rung on most of these phases of Gothic during the present century. We have already given two distinct types of purely native growth, in both of which the utility of terra-cotta has been demonstrated to a degree that cannot be gainsaid.

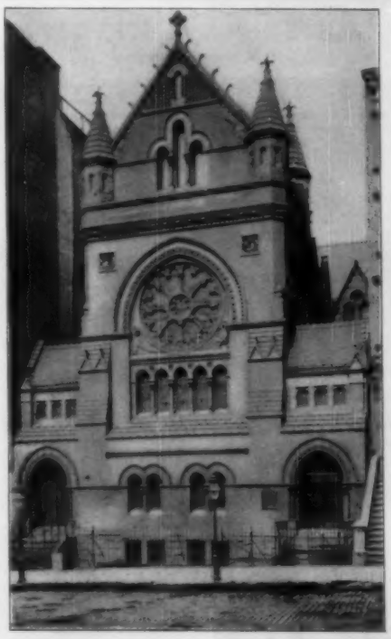


FIG. 5. CATHOLIC APOSTOLIC CHURCH, WEST 57TH STREET, NEW YORK CITY.

The first church, and one of the first buildings of importance on which structural terra-cotta was used in New York, is situated on West 57th Street, and is now illustrated from a recent photograph at Fig. 5. This church was built in 1885, a year or so prior to the introduction of terra-cotta manufacture in any part of New York State. The color is a medium shade of red, with brick of fairly even match, these materials being used exclusively above the basement level. It was designed by and erected under the direction of Mr. F. H. Kimball, and, though one of the least pretentious, is considered one of his happiest efforts.

The governing factor in this case lay in a frontage of 50 ft., situated about the middle of a block, and hemmed in by an abutting tenement of six stories on one side and a residence of five stories on the other. How to obtain sufficient light with the least sacrifice of space, at the same time to devise a plan that would admit of a seemly exterior, was surely enough to test the ingenuity of any architect. A similar task has often been essayed in the building of small city churches, but we doubt whether it has been accomplished with a greater degree of success than is to be found in the present instance. In it the central idea took shape under very exacting conditions; progressing on lines of logical continuity, the final development is such that no interpreter is needed to tell the tale of its inexorable environment. Our own humble opinion, thus compressed into the briefest space, is sustained by that of many and far more competent critics, among them Montgomery Schuyler, who, in reference to style and treatment, avers that "There is no more scholarly Gothic work in New York." This, from one who is himself considered a scholar among contemporary writers on architectural topics, is praise indeed.

The author of the observation just quoted has likewise remarked with approval the extent to which the detail throughout this building has been adapted to the materials of which it is built. On this aspect of the subject we feel rather more at home; and speaking from a manufacturing point of view, his commendation in that regard can be indorsed without reservation. The need for such adaptation as would tend to facilitate the processes of manufacture was, of course, more urgent at the time this church was under way than it would be at present; yet the architect was not forced to modify, much less abandon, his original conception on that account. Indeed, the main features of the design need not have been changed had stone been used instead of terra-cotta, yet no attempt has been made to give it the appearance of stone in color, jointing, or surface finish. While the plasticity of the material is recognized, it was not allowed to tempt the designer into a display of his entire stock in trade, or to lure him from the path of architectural rectitude.

To the technical reader, who craves a more intimate acquaintance with the things that facilitate execution and therefore affect the cost of production, we shall point out such of them as occur in the work now before us. A vertical line drawn through the center of this frontage divides it into a right and left counterpart, on both of which blocks from the same mold can be repeated. In other words, the molds that would have been necessary in the case of one entrance will produce a sufficient number of blocks for two, the second doorway, therefore, being obtained at less than half the cost of the first. This applies equally to the windows above, to those of clearstory and transepts; likewise, and more especially to the four pinnacles, in all of which the needful variety resolves itself into the fewest number of separate shapes. So, too, with the individual components of these and like features throughout the building, the analysis of which will become more intelligible if reference is made to them as they occur in Fig. 6, drawn chiefly with that end in view.

On the inner jamb of doorways a mold would be required for the plain starting blocks, of which there are only four. But then between these and the springing line we have twenty-eight others

with panel and rosette, which, being uniform in size and ornament, are all pressed from the same mold. A similar arrangement is made in the radius blocks, of which there are thirty-two, all of them interchangeable save those at the springing and apex, which receive the necessary adjustment after they leave the mold. The same thing holds good in the outer archivolt and in the hood molding. The stilt on the two right and left springers, in which the lines change from a curve to a tangent, is formed by hand on two newly pressed blocks taken from the regular mold. In the apex blocks, which are larger, an extra piece must be "slipped" to each of four regular blocks and cut so that on coming together the joint will be in the center; this vertical joint, by the way, being considered orthodox in Gothic arches. By making a mold for the largest quoin, all the other sizes could be wire-cut or pressed to correct size by using a series of stops, on the principle that the greater includes the less. In much the same way a mold can be made for a base or capital of this description, which, in technical parlance, would "work right and left."

The blocks used in receding courses, shown in section at AA, are much shorter than was at all necessary. There was no reason, economical or otherwise, for making them less than 2 ft. As it is, there are sixty-two of them, all of which were pressed from two molds, the return miters on lower course being made by hand. The same may be said of the buttress weathering and gablets, all of which, however, are cut up into unnecessarily small pieces. So also are the jambs and mullions of a very effective five-light window. The shafts stand clear, and, like those of the doorways, are without joints. The jointing through cusps may be said to look constructional, — certainly it does preserve a uniformity of scale,— but beyond that every four blocks, of which the rosette forms the center, might have been made in a single piece.

That most admirable rose window, the distinguishing feature of the whole composition, is likewise one of the best adapted for easy and successful execution. Considering that the combination contains sixty-four pieces, all of moderate size, in which there are only seven distinct shapes, the scheme of jointing is hardly susceptible of improvement. True, the cusping from the capital outward might have been jointed into sixteen, or half the present number of pieces, subject, however, to the qualifications admitted in regard to the jointing of window below. At the same time, it will be seen that these reasons are of less importance in the latter than they were in the former case, a further qualification and one worth considering. In the small medallions, all of which stand vertical, the cincture only would be molded in the block, thus allowing the heads to be modeled separately, therefore with different poses and expressions: *vide* the cloisters of the Certosa, Pavia.

The main archivolt is turned in three courses, for each of which a single mold will suffice, subject to the necessary changes at stilt and apex. These changes would be made in the way described for outer arch over entrances, where the need for special molds was easily obviated. The same principles of procedure would apply to most of the remaining items throughout this building, the dominant characteristic of which might be compressed into a single word — compactness. That quality permeates most of its members, enters into the individual blocks, and must have been of prime importance in determining the cost of manufacture.

We have gone into these particulars because of their bearing on subsequent examples; secondarily, in order to show that the purity of style need not be sacrificed out of consideration for the material. In the present case, a suitable phase of Gothic having been adopted as a settled fact, the scheme of jointing and construction was simply modified and arranged in accordance with the known exigencies of manufacture. In matters of this kind, Mr. Kimball seems to be actuated by the guiding principles which we have, here and elsewhere, endeavored to elucidate. That, aside from other considerations, is sufficient reason for selecting this interesting composition in brick and terra-cotta as an elementary example of what to do under like conditions, and how to do it, so as to obtain the maximum of merit at a minimum cost.

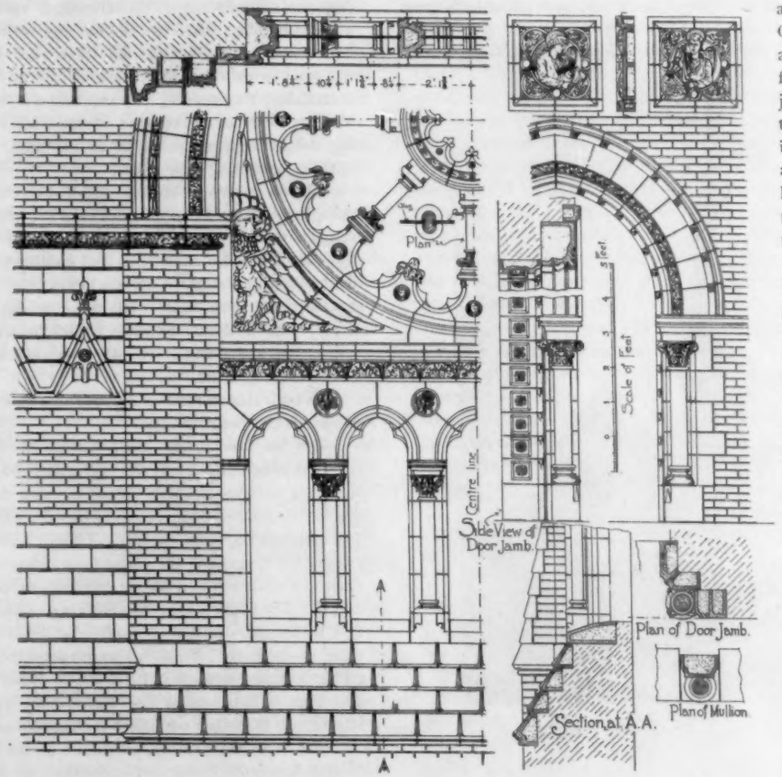


FIG. 6.

There is one exception to be noted, and it applies to the dishonest and inartistic stretcher bond in which no headers are permitted to appear. Against a practise so irredeemable we must continue to protest. The demand for honest artistic brick bonding now being made by architects of eminence [1] may encourage others to "take up arms against a sea of troubles, and by opposing, end them."

A brick and terra-cotta church of moderate cost, but highly attractive appearance, was built some years ago in what was then a residential suburb of New York (Fig. 7). Portions of the surrounding territory are now passing through a period of transition, by reason of their absorption in the greater city's scheme of consolidation, together with a more rapid utilization of its Long Island water front. The immediate neighborhood, however, has not suffered from this march of progress as yet. There is enough foliage left to form an agreeable background to the church; and through it come glimpses of white colonial residences, built in most cases by the ancestors of

[1] See article by Mr. Flagg, BRICKBUILDER, December, 1898.

those who now occupy them. In this setting, and on a sloping hillside, stands a church of red brick, interspersed with terra-cotta of a lighter shade, from which focus a glow of cheerfulness and hospitality radiates throughout its vicinity.

The only really remarkable thing about this otherwise simple exterior is the brick-built spire, with terra-cotta quoins and terminal. Judged by the favorable effect, directly traceable to the presence of this spire, the conception was certainly a momentary stroke of genius on the part of its designer. Compared with the framed and shingled or slated affairs that commonly do duty for a spire in small churches such as this, the present one conveys an idea of permanence and stability. These characteristics are in admirable keeping with the place, as we hope they are indicative of the congregation to whom this church owes its existence.

In matters of minor detail there are many things that are crude and lacking refinement. Though simple and easy of execution, there are certain improvements that could have been made with a few strokes of a pencil, and the changes would not have added to the cost

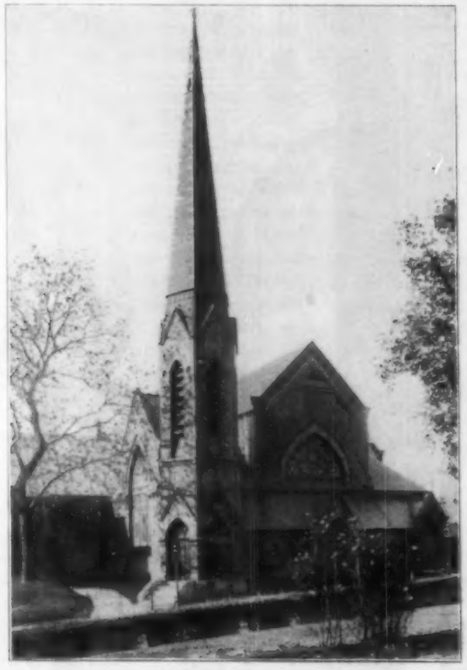


FIG. 7. DUTCH REFORMED CHURCH, ASTORIA, L. I.

of production. These exceptions are confined to the design of capitals, the profile of moldings, jambs, voussoirs, etc., and like items, for which the architect is presumably responsible. A graceful contour with appropriate enrichment need not cost more than one that is uncouth or inexpressive. Given the requisite taste and technical skill, the one can be drawn as readily as the other, while a given number of pieces possessing artistic merit will be pressed, burned, and delivered without extra charge on that account. From a thing of beauty to one that amounts to a positive eyesore is but a step, and in terra-cotta architecture that step is a far shorter one than is generally supposed. Much of the detail in this church stands midway between these two extremes, while none of it rises above the commonplace. One is inclined to regret such lapses, which, on close examination, detract somewhat from the appearance of a building that is, in many respects, a master-stroke of its kind. The work itself was among the first contracts undertaken by a firm that has since produced highly creditable specimens of architectural terra-cotta, some of which we may have occasion to illustrate in greater detail.

Fire-proofing.

EFFECTS OF HEAT UPON NATURAL STONE AND BURNT CLAY.

BY CHARLES J. EVERETT.

SOME natural stones are rapidly destroyed by fire; others resist for longer periods, and a few are but little affected by continued high temperatures. What is the cause of these observed unequal effects? Why is one stone broken into large fragments by the same temperature which reduces another stone to fine granules and only abrades the surface of a third?

In 1895 I prepared an elementary manual upon the principles and materials of fire-proof buildings. While engaged in this work I was struck by the almost entire absence of authentic records concerning our subject matter. The meager records of the behavior of various building materials in burning buildings were found to be of little value, and often carried their own refutation to any one acquainted with the chemical and structural constitution of such materials. Engineering and architectural literature were searched in vain for evidence of extended or systematic experiments for determining the relations of stone, or of any other inorganic building constituent, excepting iron, to fire.

As the results of my investigations were never published, I have thought it advisable to bring forward for public discussion one of the subjects therein treated, in the hope that it may aid in bringing to light some definite knowledge and guiding principles in place of the deplorable ignorance which now prevails.

Tyndall once said: "Right or wrong, a thoughtfully uttered theory has a dynamic power which operates against intellectual stagnation, and even by provoking opposition is eventually of service to the cause of truth."

It is in this spirit that we offer this desultory contribution to the subject under consideration.

Let us first briefly review some of the published facts and opinions concerning great conflagrations which may shed some light upon the intricate problem before us. On the occasion of the great fire in Boston, Dr. Nichols, of the Boston *Journal of Applied Chemistry*, commenting upon the fire, said that Pearl Street was lined with granite buildings, and that after their destruction "fine granitic sand from the disintegrated stone covered the pavement several inches deep." The editor of the *Scientific American* of New York reprinted this statement, and added that "the granite front walls of which many of the burned buildings were composed cracked and exploded, falling in fragments upon the street." Much of the so-called granite destroyed in the Boston fire was Quincy syenite, containing hornblende, but that does not affect the matter now before us.

Mr. Edward Atkinson, president of the Boston Manufacturers' Mutual Insurance Company, states that he has seen "granite posts 12 ins. square reduced to sand" by a fire in the lower part of a building which did not entirely destroy unprotected wooden posts in the immediate vicinity.

Mr. F. C. Moore, president of the Continental Fire Insurance Company of New York, says "granite yields to combined fire and water, . . . sandstones bear heat, but all stones are ruined by fire."

The Universal Schedule of Fire Rates of the Associated Fire Insurance Companies doing business in the United States contains this clause (Sec. 109): "Stone columns subjected to fire and water are certain to disintegrate and wreck the building if in the interior of the building."

Prof. R. H. Thurston, of Cornell University, in Vol. I. of his work on the "Materials of Engineering," also condemns granite, together with "gneiss, syenite, quartz, mica-slate, and other primary rocks. These usually contain some water. When exposed to fire they crack and even explode. Walls constituted of these stones are apt to crumble rapidly in a hot fire."

Limestones, including marble and the magnesian limestones or dolomites, are almost universally carbonates. Professor Thurston declares that in the great fire of Chicago the carbonic acid of the limestones constituting the burned buildings "was expelled with violent explosive disruption." He adds: "Magnesian limestones are little if any better. Uncrystallized sandstones, somewhat porous and free from feldspar, are the most refractory of common building stones. Clay-brick, especially when approximating to fire-brick in composition, is perhaps the best building material now known." I predict that in future editions Professor Thurston will omit the "perhaps."

Major-Gen. C. W. Pasley, of the Corps of Royal Engineers, in his work on "Limes and Calcareous Cements," published in London fifty years ago, said: "Having attentively considered the effects of great fires on houses and other buildings of the usual construction, . . . I have invariably found that good brickwork seems to be a perfectly fire-proof material. . . . I have also observed that large stones when exposed to a strong fire are invariably injured and defaced by fragments detaching themselves from the surface."

In the great fire of London (1666), Pepys, an eye-witness, in his diary tells that "even the very stones of the churches proved combustible"; and John Evelyn, writing upon the same subject, uses the following language: "The stones of Paules (St. Paul's Church) flew like granados. . . . At my return I was infinitely concerned to find that goodly church of St. Paules now a sad ruin, and that beautiful portico, for structure comparable to any in Europe, as not long before repaired by the late king, now rent in pieces, flakes of vast stone split asunder, and nothing remaining entire but the inscription in the architrave showing by whom it was built, which had not one letter of it defaced. It was astonishing to see what immense stones the heate had in a manner calcined, so that all the ornaments, columns, friezes, capitals, and projectures of massive Portland stone flew off, even to the very roofe," etc. . . . "I did not see . . . many stones but what were calcined white as snow."

The Portland stone of London is a limestone. The effects of heat upon the sandstones of northern New Jersey, fairly durable as regards weather, we have often observed, and have found them lose their coherence and afterwards crumble by heat that had left brick uninjured.

The influence upon stone of the lesser alternations of temperature due to climatic changes, annual or diurnal, may aid us in our inquiry.

Dr. David Livingstone, when exploring the vicinity of Lake Nyassa in southeast Africa, observed the effects upon rocks of rapid but quite limited diurnal alternations of merely atmospheric temperature. In the valley of the Goa, or Gova, he was at first much perplexed by the large accumulations of freshly broken, angular fragments of the granitic mountains whose slopes formed the valley, as well as by strange sounds heard at night. Watchful investigation disclosed the fact that during the day the sun's rays heated the surface of exposed rocks to a temperature of about 137 degs. Fahr., while at night the rocks cooled rapidly by radiation; the contraction induced rupture, and angular fragments weighing from a few ounces to 200 lbs. were separated and thrown violently off, producing the noises heard by Livingstone. This disintegration occurred, it will be noted, at temperatures very much above the freezing point.

Prof. James D. Dana, the late geologist, adduces as one of the causes of disintegration of fragmentary rocks like sandstone, "expansion and contraction due to daily and annual changes of temperature." He does not limit this action to cold weather.

All rocks are more or less porous, and absorb water from the atmosphere. Collating such authorities as are at hand, Professor Thurston, Gen. Q. A. Gillmore, General Totten, and some others, the absorption of water by some building stones may be roughly stated as follows: granites, one tenth of 1 per cent. by weight; limestones, ¼ to 5 per cent.; sandstones, ½ to 6 per cent. Besides this hygroscopic water, which varies in quantity with atmospheric and other conditions, some crystals of rocks contain water permanently confined in cells. Quartz crystals may contain at times as much as 5 per cent. of their volume.

The hygroscopic water which in freezing disintegrates some building stones is asserted by some writers to be a principal, if not the only, cause of the destruction of certain stones in fires. Professor Thurston attributes the rupture of granite under heat to this absorbed water, or its steam. Prof. C. J. H. Woodbury, of Boston, in his pamphlet on "Conflagrations in Cities," expresses the same opinion. But all who discuss this subject, so far as we can learn, seem to overlook some of the conditions of the problem. Let us examine the expanded water hypothesis as an explanation of the destruction of building stone by fire.

There are serious if not insurmountable objections to this hypothesis. The expansion of water, as such, through a range of say Fahr. 0 to 212 degs., is about one twenty-fifth, or 4 per cent., of its volume, quite insufficient, when the small percentage of water in the stone is considered, to account for the extensive disruption and disintegration observed. Above 212 degs. the new ratio of expansion is immensely greater, and sufficient to explain the phenomena, provided the generating steam is confined and cannot escape. But is this the case? I cannot admit the proposition. Stone or other solids sufficiently porous to admit the entrance of water from the atmosphere are likewise porous enough to permit escape of such water by the same channels as soon as pressure begins, whether it passes off as water or as steam. Why should there be any more hindrance to its outward passage than to its absorption? But why then does *freezing* water within the pores of stone expand with sufficient force to disrupt it, as constantly observed? The explanation is simple. In these cases, the water is subject to no expansion or pressure until in the very act of congealing, when its condition at once changes from that of a liquid to that of a solid or semi-solid. Its expansion, too, instead of reducing it to a more attenuated condition, as in steam, is a thickening, solidifying process. The sudden increase of volume of about 9 per cent. in freezing water is an adequate cause for its destructive effect upon rocks in cold weather. Building brick absorb water even more freely than any natural stone, but did any one ever know of well-burned brick disrupting or disintegrating in the fire? Yet, structurally, there is no reason for any distinction, so far as the effect of expanding water in fires is concerned.

Again, excluding the exceptional cell water of some quartz crystals, both limestones and sandstones on the average contain a much larger proportion of water than the granites. Observation informs us, however, that the destruction of granites in fires is equal to that of limestones and greatly in excess of that of the far more absorbent sandstones. Surely, the water theory does not agree with the phenomena.

Then there is the carbonic-acid theory, supported by Professor Thurston. Many unreflecting writers have espoused this hypothesis in the face of its obvious refutation by the phenomena of every fire where marbles are exposed to moderate heat. In the first place, carbonic dioxide is not liberated from its base in limestones by temperatures below a full red heat, and that continued for sensible periods; and in lime burning we find that many of the amorphous stones are not disrupted at all, but retain their shapes under red heat. This process of calcination necessarily destroys the structural condition of a crystalline limestone like marble, and at once changes its external surfaces to a degree that is unmistakable. The crystals of lime carbonate disappear under the loss of nearly half their weight of carbonic acid; the bright, glistening surfaces give place to a dead white or a yellowish color, and atmospheric moisture and carbonic acid soon attack the resulting quicklime and reduce it to a crumbling hydrate.

If any sensible portion of the standing walls of a marble front building have ever become heated to a full red heat during a conflagration in our land, I have yet to learn the fact. In the hottest fires of New York, I have never seen any near approximation to such temperature in walls of any inorganic material.

Immediately after the burning of the Manhattan Savings Bank

and other adjacent buildings at Broadway and Bleecker Street in November, 1895, I made an exhaustive examination of the premises. On the white marble front of the Bleecker Street Savings Bank (adjoining the Manhattan Bank) was a colonnade with massive marble columns. The bank front was exposed to merely radiated heat from burning buildings opposite, yet slabs were thrown off from the columns, one of which measured 6 ft. in length, 1 ft. in width, and 2 ins. in thickness, while pieces weighing from 50 to 350 lbs. were detached from the marble cornice and other parts by the same heat. One of the battalion chiefs and some of the firemen who were present during the fire informed me that the temperature of this marble front was at no time very high, that there was no fire within the building, and that no water was thrown on the heated stone. The bank's wooden entrance doors and casings just behind and between the injured columns were not even burned through. A minute examination of all marble fragments and of stones from which they were detached revealed in every case a fractured surface of bright, uninjured crystals, while the outer exposed surfaces, discolored by dirt and age, showed a like crystalline structure when cleaned.

In the recent case of the partly burned Home Life Insurance Building in this city, I made a similar investigation, and with precisely the same results. In neither of these buildings just mentioned was I able to detect any sign of calcination or decomposition of crystals in these marble fronts, save in very circumscribed edges of some window sills of the latter building, where the escaping flames beat most fiercely. In the Home Life Building, also, 12 in. diameter marble columns were split from top to bottom by the heat, far above the reach of a stream of water.

The alleged calcination of limestones in the London fire observed by John Evelyn may readily be explained in another way. In London, all light-colored building stones rapidly become discolored, even to blackness. Their freshly fractured surfaces in strong contrast with their dark exteriors would easily mislead an observer at such an exciting time. Newspaper reporters are frequently deceived in the same way here. But if separated fragments of limestone fell into burning ruins they might easily be heated to calcination degree.

In the instance related by Dr. Livingstone no argument is needed to show that neither expanding water nor carbonic acid were factors in the continual breaking of the rocks. We seem to be thrown back upon the hypothesis of rupture of building stones in the fire by unequal expansion of different parts of the same block, consequent upon unequal temperatures of the different parts. But here, again, we are met by the fact that ordinary red sandstone has a rate of expansion by heat which is double that of granite and one and three quarters that of white marble, yet the sandstone is more durable in the fire than either of the other two stones.

Granites and marbles, the most susceptible among building stones to high temperature, are crystalline in texture. Whether of igneous or aqueous origin, their crystals are alike imperfect, irregular or deformed in shape, indicating restraint or coercion during the crystallization and solidification of the rocks. Resistance to perfected normal crystalline forms by great external pressure would leave the solid under a stress. Such stones may reasonably be regarded as existing under a strained condition of their crystalline constituents, so that a slightly increased stress, under new conditions of environment, may lead either to violent rupture or to rapid disintegration.

All crystals except those of the cubic system expand by heat along their different axes in unequal ratios, and in such expansion their angles are altered, and each crystal undergoes a sensible distortion of form. With rare exceptions, crystals of the cubic system are not found in quartz, feldspar, hornblende or limestones, including dolomites. This strain of unequalized expansion of each individual crystal of such stones as marble and granite, under moderate heat, may be sufficient in the aggregate to induce rupture; but there is also the possibility of a further stress growing out of the abnormal conditions of the genesis of the rocks, as just indicated. We leave the subject here for the consideration of those who are better equipped for pursuing this investigation to a final issue.

Masons' Department.

CONTRACTS.

BY JOHN LYMAN FAXON.

IT may be well to state that the use of the words "contractor" or "contractors" in these papers does not refer solely to contractors of the whole, but to all — both of the whole and "subs." — who contract for work of any kind; and generally, the evils of the present systems, which I am considering, are of the sub-contractors rather than of the contractors of the whole.

As to the nature of contracts *per se*, it would seem at first thought that the nature thereof needs no elucidation or explanation, and yet the general idea as to the full meaning and force of a contract is so vaguely understood and the obligations so lightly held, that some extended consideration seems desirable.

It may be said with truth, I think, that all contractors would, individually, decidedly object to an owner's attempt to beat the contractor out of from 1 to 5 per cent. of the contract price, and yet many contractors think it quite legitimate business to beat the owner out of from 1 to 5 per cent. of the work, materials, and labor which has been contracted for. Contracts generally are of two forms, oral and written (sometimes implied, but implied contracts are rare, except as parts of an oral or written contract, so I will not deal with them separately), and usually both embrace some things implied and not specifically spoken or written.

An oral contract may be and is just as binding as a written one, provided the terms are simple, direct, and made before two or more witnesses; for instance: if A agrees with B to furnish something in six months from date, for a stated sum or consideration, it matters not whether the value of the thing to be furnished by A goes up or down; if it goes up, A cannot plead that he cannot or will not fill his part of the agreement because he will lose money; and on the other hand, if the value goes down, B cannot plead that he will not fill his part of the agreement because the thing can be procured for less money: the original terms constitute the contract. A cannot furnish a poorer thing, and B must pay the full sum or consideration. The law will hold A and B to the bargain, if reputable witnesses are at hand to prove the terms of the contract. A contract *per se* is an agreement by and between two parties to do certain specific acts, each party agreeing to do or provide something which is to stand as an equivalent for that which the other party is to do or is to provide. The nature of the specific contract (legally) may not imply, or provide, mean, or guarantee, that what one party is to do or provide is to be, or of necessity must be, a full equivalent for what the other party is to do or provide (morally, of course, it should be so; and on the other hand, *morally*, a contract once made, its terms should be faithfully performed whether they are equivalent or not, providing the making of it was not gained by fraud). The contract is *prima facia* evidence that the things to be done or provided by the parties were considered, at the time of making the contract, as equivalent; and the terms must be fully performed by both parties. If X contracts with Y to deliver a ton of beans, of specific grade and quality, for one dollar, the contract is just as binding as if Y was to pay the full market value of the beans. X must furnish the kind of beans specified, and Y must pay the dollar; and the same would be the case if Y had agreed to pay twice what the beans were worth. The law, rightly and judicially, cannot go back of the specific terms of the contract, providing said terms have not been modified, and have been strictly adhered to: if Y ordered X to furnish two tons of beans and then refused to pay for them, Y can be made to pay, for the additional ton, at fair market rate, provided it was not understood to the contrary, — the second ton of beans would be "an extra," so to speak; and on the other hand, X is bound to furnish 100 per cent. of a ton of beans, and not 99 or 95 per cent.

So also, if a contractor duly agrees to erect a building for a specified sum, it matters not whether the sum to be paid is a fair market value for the building: either way; the execution of the contract is *prima facia* evidence that both parties knew what they were about and doing at the execution of the contract; and the law will hold the parties to it, so far as it goes, taking into account the evident nature and use of the building and the evident intent and meaning of the contract, as applied to the particular building in question.

A building contract, or one that pertains to a building, differs materially from all other contracts, because the very nature of it embraces and contemplates innumerable details of essential importance, and many things which of necessity must be implied rather than specifically mentioned or illustrated. It is therefore needful that contractors should know and understand that the greater includes the less; that the contract *per se* includes and governs the plans and specifications, and that the plans and specifications do not govern the contract, only in so far as they are specifically illustrative and explanatory of the contract. The contract goes further than the plans and specifications, for the contract may imply — generally does — things not specifically set forth in plans or specifications, but which are needful and requisite to the due and proper execution of the contract and the erection and completion of the specific building according to its class and destined use. Most contractors do not understand or realize this implied element of contracts, which is, nevertheless, an integral and essential part of all building contracts; and herein comes the need of that technical training which I will refer to in a following paper. In illustration of the implied conditions I recall two separate cases, of parallel nature and effect. Contracts were made for the erection of two houses, which provided that said houses should be "built and completed," or words to the same effect; in the one case, the architect omitted to specify the finish flooring, and in the other, the architect specified the boards, but omitted to specify the laying. The contractors refused to furnish and lay, the cases went to court, and the courts decided against the contractors, and rightly, for in either case (without specific conditions to the contrary) the houses would not have been properly built and completed, or the contracts duly performed, without the finish flooring, properly provided and properly laid; for the courts hold that a contractor cannot take advantage of an evident unintentional omission of the architect which is essential to the due and proper erection and completion of a building, which is general and customary in and for a building of its class. The extent to which details (not specifically set forth in specifications) may be carried depends of course upon the architect (if there is one, as there should be in all cases), and what one architect may or does require has no bearing upon what another architect may require, except in case of disputed contract being taken to court, when the finding will probably rest on the testimony of competent experts; and in such case it would be a question of extent and quality and not of outright omission. Nine times out of ten, contractors had best rest their case with a reputable architect rather than take it to the courts. The architect's technical knowledge and his faculty of looking at all sides of a question best fit him to decide such matters.

And herein comes the *professional duty* of the architect to see that his plans, contracts, and specifications are clear, specific, and technically intelligible. Architects are not responsible for lack of knowledge in contractors, as to the reading of plans or the technical terminology of contracts and specifications. Plans and specifications are prepared for the intelligence of the trained mind; they are of necessity technical and scientific when properly prepared; all ambiguity and chance for misconstructions should be carefully avoided; the architect should know what he wants, and clearly specify it, and require that and nothing else to be furnished. On this rests his professional reputation, and the solidity, finish, and economy of his work. Some architects err in the making of plans less full than what they should be, and in the attempt to "boil down" specifications. This is a mistake, both as regards clients and contractors; while brevity is the soul of wit, brevity is not the most desirable quality in plans and specifications. For as things are, competition will always be sharp, and the temptation "to get the job" sometimes gets ahead of the judgment of even the best contractors, while others figure to "get the job anyway," trusting to luck, persuasion, or other means to be "let up on" when the building is under way. The architect will therefore avoid misunderstandings, trouble, and vexation, by making his plans and specifications specific and careful in detail, so as to facilitate intelligent estimating, and avoid misconstructions and "extras."

Some contractors object to plans and specifications "too much in detail," as such plans and specifications do not allow "chances for a lot of extras." This is a mistake on the contractor's part. Clients do not take kindly to "extras." The most satisfactory contract all around, and the *strongest* for both sides, is that one which is complete in itself, and under which a building is erected and completed without "extras." This is not always feasible or possible, but it is the best policy when possible.

Another erroneous idea which many contractors have is that the provisions of one contract have a bearing upon another contract; and they try to enforce their argument by what they consider "customary" or "my way of doing it." Now it needs to be clearly understood that such arguments have absolutely nothing whatever to do with a contract; the provisions of two contracts out of the same architect's office have no bearing whatever one upon the other. Each contract is of itself apart, separate from all others, and is to be considered and executed solely in respect to the individual case which it represents. Circumstances alter cases, and it does not follow, because an architect specifies a certain thing, or a specific manner of doing work in one case, that he desires or deems it advisable in the next. The trained architect learns something between one "job" and another which he did not know before; he keeps ahead of himself, so to speak. Contractors should, therefore, carefully examine and read each set of plans and specifications and contracts, and thoroughly digest them, and not take things for granted, or "guess at the cost of it"; the time has gone by for such things.

I recall an instance, back in 1873, which may be worth the telling. At that time the city buildings were being done by two architects: X would have one, then Y, then X, then Y, and so on, and the plans were not such as our best architects now prepare. They usually consisted of a barely necessary number of sheets, with little or no detail on them, more or less colored to make them "look pretty," and a few pages embraced the specifications. Scene: an architect's office; time, 11.45 A. M.; bids on schoolhouse to close at 12 M.; contractors around table making up figures. In walks "Uncle Ben," a tall, lank, familiar figure of those days. He lifts up the cover of the portfolio containing the plans, counts the sheets, eleven of them, reaches back to his hip pocket, takes out a tape measure, scales the plan and elevations, makes a few figures on an envelope which he takes from his hat, tears off a scrap of paper, writes his bid on it, calls for an envelope, directs it and deposits on architect's desk, and walks out. One of the contractors, who has watched the proceeding, gathers up his papers and leaves, remarking as he goes that "he'll be 'embalmed' if he figures against a man who uses a tape measure." "Uncle Ben" got the job. The secret of the matter was that "Uncle Ben" had just completed a schoolhouse, to all intents and purposes just like the one being figured on. Architects were not over and above particular in those days, and the science and demands of planning and building were not what they now are.

The immoral effect of profit or loss on the contractor and its reaction on the architect is another evil of the present system; it may be argued that contractors need, must, take into account profit and loss; granted, but the time to take this into account *is at time of estimating*, and *before* the contract is executed, not afterwards. No law compels a contractor to take a contract at a loss; he is a free agent in the matter; but after the contract is executed, the question of profit or loss has absolutely nothing whatever to do with the matter, and should not be referred to or considered, either by con-

tractor or architect. The altogether too prevalent custom of endeavoring to influence the architect's judgment and requirements by reference to profit or loss is distinctly immoral and reprehensible, and lowers the tone of that integrity which should be the guiding rule of action in such matters. There may arise honest differences of opinion as to details; these should be settled *per se*, without reference to profit or loss, and by the determination of the architect, he being the only competent person to rightly interpret the plans, specifications, and contract. It may be claimed that "architects are sometimes exacting, over-exacting"; nevertheless I do not think that such claim can be substantiated, certainly not to any material extent, and certainly not with any architect who is well qualified for practise of his profession. The difference lies in the different points of view of contractors and architects, and I think, as a general proposition, it may be said that there is more need of contractors advancing to the architect's point of view than the reverse.

Another consideration which should be taken into account is, that every architect who demands and requires the honorable and full execution of contracts in his hands is doing just so much to drive "low bidders" and irresponsible and incompetent contractors out of the field, and is doing just so much of good and benefit to every reputable and responsible contractor, and doing much towards establishing honest work at a fair price. Architects should bear in mind that poorly prepared plans and loose, ambiguous, and carelessly drawn specifications and contracts are a boon to the low bidder and irresponsible contractor.

Reputable architects desire to deal with reputable contractors, who can be depended upon to carry out the architect's plans and directions in a friendly spirit of honorable compliance, and take pride in doing so; and to such contractors, architects wish them a fair price with a fair profit. The *best* work is none too good, and is the only kind which will redound to the credit of the contractors and architects, and is the only kind which is for the client's interest.

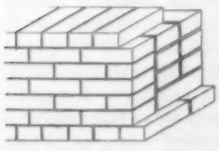
FULL-FACE HEADERS FOR PRESSED BRICK.

EDITORS THE BRICKBUILDER: —

Dear Sirs: — Will you kindly, through your journal, answer the following question: —

How should the headers be laid in a wall faced with press-brick, to comply with the following specification? Specification: "Pressed brick to be worked in regular bond and tied with full-face headers every sixth course, or less if common brick backing will so work."

We should say that this specification calls for headers of pressed brick, laid in at most every sixth course. We are also of the opinion that a "full-face header," worked in regular bond, means a special header brick, made 8 ins. square, so that when laid in the wall it has the appearance of a stretcher, while in reality it extends back 4 ins. into the common brickwork. Where regular or plumb bond is used, this is the best method of tying pressed brick to its backing, by means of brick, although a good metal tie may answer as well.



As only a few manufacturers make square bricks, however, it would perhaps not be fair to put this interpretation to this specification, unless it had been explained to the contractor what was desired.

We would therefore say that by this specification the contractor should be required to tie the pressed brick as shown in the accompanying illustration.

BOND FOR PERFORMANCE OF BUILDING CONTRACT.

THE Supreme Court of Michigan has ruled that sureties on a contractor's bond conditioned for his faithful performance of a building contract, which provides that the consideration is to be paid to the principal at times therein specified as the work progresses, are released from all liability on the bond, if the payments are made before they are due under the terms of the contract.

Brick and Terra-Cotta Work in American and Foreign Cities, and Manufacturers' Department.

THE BRICK ARCHITECTURE OF WASHINGTON, D. C.

BY F. W. FITZPATRICK.

NAPOLEON, so tradition says, upon his return from one of his frequent little surprise-party excursions into the country of his neighbors, the enemy, — and he had them on all sides, — was met outside a frontier town by the mayor and dignitaries of the place. The mayor, with much bowing and scraping, began a long apology for not greeting him, as was the proper caper, with salvos of artillery; going on, with much volubility, to give the impatient and hungry conqueror seventy-six reasons for not so saluting; the first was that there was not then nor had there ever been a cannon in the place. "Hold on, my

THE DUDDINGTON AND VAN NESS MANORS.

boy," said His Emperorship, "skip the other seventy-five and bring on the savory viands," or words to that effect.

This is a somewhat analogous case. I am volubly inclined, so truthful friends warn me, and I know of ninety-nine good reasons for not writing upon the above-entitled subject. The least important of these is that I know but little about the subject. And now the impatient reader may turn to the next article if he, like the mighty Bonaparte, thinks *that* sufficient reason and hungers for meat: I can offer him but broth.

It's not altogether my fault, however, for when THE BRICKBUILDER invited me to contribute this paper I mildly protested that while I loved brick and appreciated its possibilities, force of circumstances had kept me, nearly all my life, in far closer touch with just mere granite and stone; and I ventured to suggest a learned treatise upon those, to me, familiar materials, or upon steel, or "The Ethics of Architecture as She Is Preached *vs.* The Observance Thereof," or "Twenty Reasons Why the Other Fellow Always Wins Out in a Competition," or anything of that sort; but these were all scorned by THE BRICKBUILDER, who'd have nothing, of course, but brick, and "Brick in Washington" at that!

Now, Washington is one of the last places on earth one would select voluntarily to make a study of its brickwork. It was begun during a period of transition. Unlike the cities of Flanders, of Holland, and of continental Europe generally, where "in brick was wrought the perfection of their art," Washington blossomed forth at

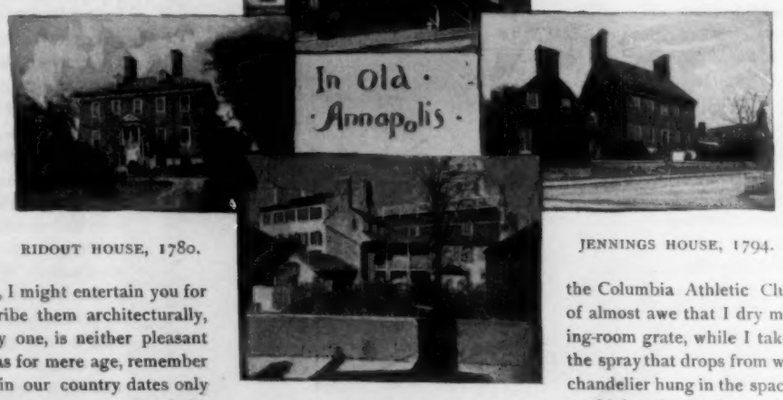
a time when the Americans had almost ceased to bring brick from England; were manufacturing a rather imperfect article themselves, and invariably plastered over it, defects and all, a thick coating of stucco most painfully "poynted off to represent ye coigns and cources of ye solid stone." The trimmings were of real stone or counterfeited in wood, and the important buildings were entirely of stone, so Dame Fashion then decreed. Then, by a train of circumstances over which no one seemingly has any control, our modern buildings of brick are, as a rule, costly, elaborate, but, with rare exceptions, generally worse than atrocious in design. Of these more anon.

TUDOR HOUSE, GEORGETOWN.

There is hardly anything in the brickwork of old Washington that compares with old Boston, old Philadelphia, Alexandria, Annapolis, or Baltimore. Its suburbs of Georgetown, Arlington, and Bladensburg add but a few artistic touches to its faded charms, and I must tell you right here that I am not one to fall down and worship everything that is colonial merely because it *is* of colonial times.

If I could deal with the histories of our old buildings, other than structural, the great men and the stately dames who have lived in them, the tragedies, the comedies, national and domestic, that have been enacted within their walls, I might entertain you for a while; but to describe them architecturally, the task, while an easy one, is neither pleasant nor interesting. And as for mere age, remember that the oldest house in our country dates only to 1564, — the old *coquina* monastery, of St. Augustine, Fla., and it has not only no peer in the land, but not even a mate of the same century!

PEGGY STEWART'S HOUSE, 1763.



RIDOUT HOUSE, 1780.

JENNINGS HOUSE, 1794.

THE FRANKLIN AND BELLIS HOUSES, PRIOR TO 1760.

The Duddington Manor, the old Carroll mansion, was the first brick house of any importance built in the new capital. It stands to-day a dilapidated, uncared-for relic of the former grandeur that perched for a time on Capitol Hill. A broad, shallow house, nine windows wide and but two in depth, absolutely void of brick detail, two stories high, the home of Daniel Carroll, one of the three commissioners appointed by Washington to lay out the Federal city; and it was the location of this house right in the middle of New Jersey Avenue, I believe, that raised the rumpus terminating in Major l'Enfant's dismissal from the service but two months after his plan of the city had been approved, — a plan, by the way, that Jefferson had as much to do with as did l'Enfant. What a genius was Jefferson! Sage, diplomat, President, scholar, architect, — verily the most versatile American in our history! Washington owes much of its beauty to his taste, and not only did he design his own beautiful house and the College, but his letters would also indicate that most of the manors of his time and built by his friends here and elsewhere had their inception in his fertile brain.

MACKALL HOUSE, GEORGETOWN.

OLD HOUSE AT GEORGETOWN.

In 1820 the Burns house was completed, — the David Burns who stood out so long against the blandishments of the commissioners, and of Washington himself, who tried to induce him to sell his farm to the proposed city. His daughter, a great beauty, married a Van Ness and became mistress of this stately old manor. It was designed by Latrobe — the Richardson of that day — and cost over $60,000; finished in costly woods and rare marbles, shaped like a thick H, five windows wide, it is one of the most pleasing designs of that time. But brick was of secondary consideration there, too, merely the plain wall surfaces, stone, wood, and metal, being the ornamental and beautifying mediums of the exterior. Its grounds were spacious and must have been beautiful. To-day we use a part of them for a running track, tennis courts, and field sports of the Columbia Athletic Club. It is with feelings of almost awe that I dry my sweater by the drawing-room grate, while I take a shower bath from the spray that drops from whence the grand crystal chandelier hung in the spacious dining room! Yet, methinks, this is less of a desecration than its former use, for when we took it it was a beer garden.

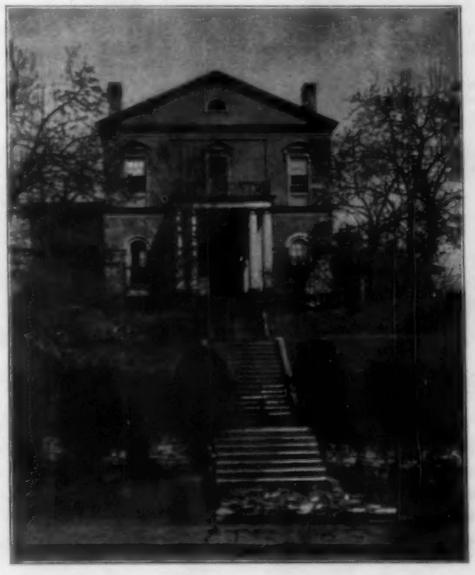
About the beginning of the century Col. John Tayloe built the Octagon house, a near neighbor to the Van Ness mansion, — a pretentious house with the savor of London about it: externally plain, three stories and basement, of a red brick with marble trimmings, and its interior spacious, artistic, and costly, as befitted the home of a man whose "income was princely, and whose artisans and slaves were so many that without calling upon outside help his own people felled the forest, wrought iron, worked the fields, and built and sailed his ships." The building, restored and rejuvenated, is now the home of the American Institute of Ar-

BRIDGE STREET PRESBYTERIAN CHURCH, GEORGETOWN, 1782.

chitects, but *in transitu* it too passed through unsavory repute. Near by are the abandoned Everett and Wirt mansions, as ancient and replete with history as the last named, but for our present purpose of little interest. Around Lafayette Square, neighbors to the White House, are grouped the later buildings of "ye olden time," most of them built just after the War of 1812: St. John's Church, still the fashionable place of worship, a good example of colonial ecclesiastical architecture, of brick, but stuccoed. Commodore Decatur's home, now occupied by Mrs. McLean, a very plain brick house, stands upon another corner opposite the square, and diagonally opposite this is the rather handsome Italian villa known as the Corcoran house; very large, well built of brick and stone, it is still one of *the* houses of the city. The late Senator Brice lived there for years in great pomp and splendor. The other Tayloe house, now occupied by Vice-President Hobart, is one of the most interesting of this octet of fine homes. Of yellow brick, with plenty of green blinds, foliage, and railings to relieve it, one never tires of passing by its cheerful front. Then there is the Dolly Madison house, now the Cosmos Club, brick, but stuccoed.

OLD CORCORAN ART GALLERY.

In Georgetown are some fine old homes, not architectural beauties, merely brick and stone put together in more or less true colonial proportions, but surrounded by broad acres, high, commanding a splendid view, and with histories. The old Tudor place, built in the middle of the last century, and still occupied by the kin of the Father of his Country, and well kept up, with its stiffly laid-out rose plats, its boxwood hedges, and other colonial accessories, is one of the best of its time. Washington, the Lees, and other notables of the long ago have danced upon its waxed floors and eaten at its well-spread mahogany. Of later date and more pretentious is the Linthicum manor, once the Russian Legation, now the Blount home, of brick, interesting, very large, and well kept; the Mackall house, the old Scott house, occupied by Grant during the war and more recently by yours truly, who can attest that there is no better nursery for seven riotous youngsters than one of these grand old baronial dining rooms, nor no better shade than these grand old oaks offer for the weary progenitor of those seven to swing his hammock under, and read and smoke and forget the cares of yesterday.



THE OLD COLUMBIA BANK, GEORGETOWN.

In the same category may be placed other near-by old homes, such as the old Dumbarton house, near the Zoological Park, Dumblane on the Tennalytown road, and the old Lee home at Arlington, now the superintendent's headquarters of the great National Cemetery. All of these are of brick, most of it concealed, however, under stucco or paint, but interesting, quaint, treated in a simple, dignified manner, and so restful to the eye after gazing at some of our modern, patchy, crazy-quilt efforts called designs.

Two good examples of last century's brick structures were the old Presbyterian Church (Bridge Street), that vied with Christ Church, of Alexandria, in historical interest and in the beauty and simplicity of its design, and the Columbia Bank, reputed to have furnished the money for the defense of the country in 1812.

As stated before, some of these are kept in repair, are habitable, sightly, and, with the splendid old Capitol and departmental buildings, give the dignity of age to our city that is one of its chiefest charms; but most of them, alas! are mere crumbling ruins, relics of bygone grandeur, decrepit veterans of many wars.

The older brickwork is, of course, in the good old "English bond," alternate courses of headers and stretchers, averaging 9 by 4½ ins. by 2¼ ins. thick, laid in lime mortar, that will still outlive much of our high-priced, high-test "cements." The facing bricks are generally gauged and rubbed to a pretty good surface, with clean-cut angles, "queen closers," and neatly laid. Naturally, when the "Flemish bond" craze was revived in England the buildings here of the same period followed suit, and we have several examples of alternate header and stretcher, followed in the later work by our more modern interpretation of "English bond," one course of headers to three, four, and five courses of stretchers.

. . . . . .

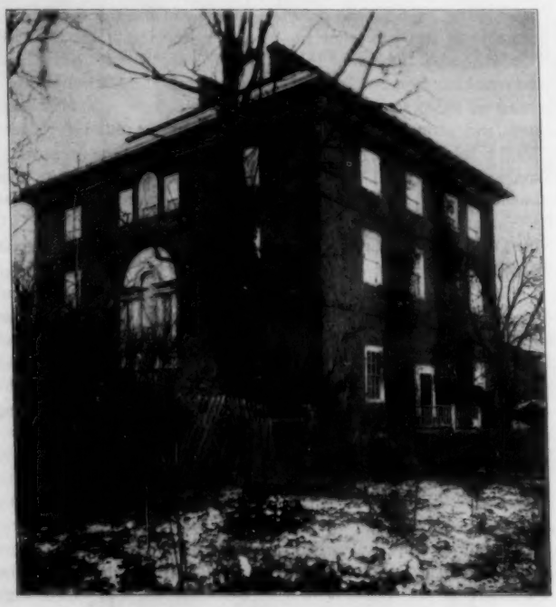
The Capitol, the Treasury, the White House, the Patent Office, and most of the government structures are of marble, granite, or other stone, — generally fine specimens of architecture, and some unsurpassed anywhere in beauty and stateliness, designed by master hands, and they stand out in sharply accentuated contrast with those built of brick. It seems strange that whenever brick was decided upon, or when appropriations would not warrant stone structures, the designing was left to inferior hands and minds, — a slight upon brick that we should resent, all who appreciate and realize the possibilities of that splendid medium of expressing one's ideas. It remains for us to so impress our legislators with its advantages that past mistakes will not be repeated. Brickmakers, the editors of BRICKBUILDER, and all interested in the development of that material, should make it their business to see that their congressmen "urged" the adoption of brick for a portion, at least, of the sixty odd United States buildings appropriated for by this last Congress. Urging is potent, oh! so potent in such matters, and no one appreciates its potency more than the poor fellow who receives the urging.

Walk with me down the "Mall." Note the Smithsonian Institution, a stone structure, graceful, dainty, almost poetic, a "symphony in form," it has been called, and without stretching the point. Then glance — a glance will be enough — at its neighbors: the Bureau of Engraving and Printing, a great bleak, brick barn, but possessing one redeeming feature, in that it makes no pretense at being anything else than a factory; a little further on there is the National Museum, with portals, pavilions, turrets, and other "accessories after the fact" in red brick relieved by beauteous spots of yellow and of black brick, a splendid

CORCORAN HOUSE.

foil to make one appreciate the charms of the Smithsonian; the next member of the "conspiracy against brick," as I have heard our United States brick buildings termed, is the Department of Agriculture; French in feeling, $300,000 worth, Mansard-roofed, its red brick also relieved with more spots, this time of black and of yellow, it puts one into a melancholy, despondent, *Et tu, Brute!* feeling that almost prevents one's proper appreciation of the beauty of its surrounding trees, flowers, and verdure. But as a fitting climax, let us leave the "Mall" and stroll over to Judiciary Square, and there take in the charms, the very apotheosizing of brick in governmental architecture, the Pension Bureau. A drawing even by Pennell or Gregg, or any of the other lights, would utterly fail to give the faintest idea of the reality, a camera fails more dismally still, and my pen, steeped even in gall, cannot give you a word picture of the *index* to its description. It has one of the best sites in the country, open on every side, second in location only to the Capitol,— verily a lost opportunity.

Technically speaking, it is three stories high, surmounted by a clearstory; it covers a space of 400 by 200 ft., and was finished in 1885, and, as stated in an official report of that time, "is built to resemble the great Italian palaces" — ye gods! Its greatest charm, apart of its being of pressed brick (and, unfortunately, of good workmanship), is its ornamental course of yellow terra-cotta over the first-story windows: a continuous line of that color and the only relief from the red there is about the entire — I was going to say *composition*. This frieze represents either four or six infantrymen, I forget which, but it makes little difference, marching on to war; these are followed by two mules being furiously lashed by a darky, they (the mules) evidently carrying supplies through the mud to the advance lines; these mules followed by more mules dragging a field-piece, and again more mules surmounted by the general staff or just mere cavalry; then the four or six infantrymen pursued by the aforesaid mules again, and so on for twelve hundred feet of frieze, containing, roughly guessing, about thirteen thousand feet of infantry, cavalry, and mules, — a miniature not over two feet high, a very rebus in feet!



THE CHASE HOUSE, ANNAPOLIS, 1770.

One consolation we have is that that building was not perpetrated by an architect, but by an army engineer (eminent in bridge structures, water fronts, and fortifications, a great and good man, though, peace to his ashes! he so cruelly wronged our art), and yet even that consolation is counteracted by the sad thought that being nearly all of brick it is practically fire-proof and almost indestructible.

GEORGETOWN CAR BARN.

Washington is a city of churches. There are some rather handsome ones in stone, but those that are of brick are so close of kin to those you see every day, everywhere, — so commonplace,—that they merit no special mention. Generally supposed to be Gothic, at least, they nearly all have ogival windows with beautiful wooden tracery in them, and real red, blue, and green stained glass here and there; a pointed roof with a gold-leafed cross or finial at its apex, and one of the same brand surmounting its "tall and willowy" spire, that shelters—every blessed one of them—that hidden foe to our peace and contentment, a bell. Are *they* not Gothic?

VICE-PRESIDENT HOBART'S HOUSE.

Of the other semi-public and commercial brick buildings, some are interesting, few are beautiful, and many neither interesting nor beautiful. Our schools are about on a par with our churches: you see them everywhere from New York to San Francisco; they are excelled here in ugliness by the fire stations generally. The Metropolitan Club, a red brick, has the good taste to not be pretentious, and in that does not challenge criticism. The Columbia Athletic (lately gone under the hammer to the Y. M. C. A. — *vale*, old friend!) is pretentious, red, and ugly; the Army and Navy is also red, not bad, weak in detail, but masses up pretty well. The Convent of the Visitation, red and black, is *very* ordinary. Our stores and office buildings (there are remarkably few of the latter; this is not an office city, though a city of offices) merit hardly any notice. They are generally pretty well covered over with signs, a virtue in most cases, and would rank with those of a fifth-rate city. There is not even a savor of metropolitanism about them. Two or three have lately been erected, among them the Western Union Building, the Columbian Office Building, and the Inter-Ocean Building, plain, unremarkable affairs; no one would ever stop to look at them, but true, too, there is nothing that calls for criticism: they are *just* mere buildings.

The hotels and apartment houses, and they are legion, are mostly of brick; generally old buildings kept well painted, but not architecturally important. The newer ones have suffered the same fate as did the governmental brick structures; put mildly, they are not masterpieces. The Shoreham, the Grafton, the Cochran, the Buckingham, and the Richmond are much cut up, lack repose or style, and not one of them but could have been wonderfully bettered, and without additional cost, by the artistic handling of some one who did *not* design them.

Two, however, merit particular anathematization: the Portland, that stands upon a rather trying lot, it is true, a triangular corner piece, and whose designer solved the problem by making an accordion-plaited affair of it on plan and gave it the semblance of an Indian pagoda in elevation,— a wonderful building in design, form, and color, and merits the worst you can say of it because its architect boldly challenges you to it, courageous man! The other is the Cairo, a great big thing, some twelve or thirteen stories high; at

least, you see it from all over town. It, too, asks you to hit it, — clumsy, pretentious, bad. Its designer saw one of Sullivan's daintily decorated, rather fascinating East Indian creations in brick and steel, and, like the speckled rods of old, it had a peculiar effect upon him, for he brought forth that thing, — a hat box with a projecting and very thick lid on it, with here and there Sullivanesque *motifs* judiciously spattered about it.

PORTLAND FLATS.

The old Corcoran Art Gallery merits a visit just to note what we used to call a beautiful brick building in 1875. Look at its picture, then offer up a prayer of gratitude that the standard has been raised a bit.

The hotels are receiving a new member that, however, does not belong to their class. The Raleigh is building an addition to its present quite old and ordinary structure that is very handsome indeed. When the old building is replaced by a continuation of this new wing it will be one of the most ornate and handsomest hotels in the country. The lower portion and most of the ornamental work above are of stone, but the masses, piers, and plain parts are of a pearl-gray brick, so it is about as much of a brick building as most of the big fellows are. As near as I can judge from what has been erected it is a pre-Renaissance treatment, tending to a German rococo, something on the order of the Waldorf-Astoria, and by the same architect, Mr. Hardenbergh, of New York, and goes far towards the redemption of brick building in Washington from the slough it seems to have fallen into.

Of this same class of redeeming brick structures are the Lafayette Theatre and the Columbia University, good, plain, eminently respectable, light-colored brick, well designed, and welcome additions to our architecture. We have two railway stations, half a dozen markets, and other such buildings of brick, none of which merit any architectural attention, unless one were compiling a treatise on "Dont's" or "What Not to Do."

One of the newest big buildings is the Georgetown street-car barn, a confection in gray stone and liver-colored brick, — well built, really a good piece of engineering, and undoubtedly well fitted for its purpose, but of a most wonderful design, "surmounted by a tower of noble proportions." Whoever designed the thing, and I hope it was not an architect, has contributed liberally to the retarding of our progress in artistic brick structures.

There are a couple of brick breweries whose positions upon the river front, high chimneys, towers, ventilators, and other minaret-like adjuncts make them quite picturesque affairs — from the great distance one generally sees them. It might be different if one could get near them.

(*Continued.*)

ILLUSTRATED ADVERTISEMENTS.

CONKLING-ARMSTRONG TERRA-COTTA COMPANY, page v, Dental Hall, University of Pennsylvania, Philadelphia; Edgar V. Seeler, architect.

Fiske, Homes & Co., page x, fireplace mantel; Henry B. Ball, architect.

Boston Fire-Proofing Company, page xxii, Hotel Touraine, Boston; Winslow & Wetherell, architects.

Celadon Terra-Cotta Company, Ltd., page xxvii, Gate and Gate Lodge of the Woodlawn Cemetery, Everett, Mass.; William Hart Taylor, architect.

NEW YORK. — The Fourteenth Annual Exhibition of the Architectural League has just closed, and the results are most gratifying. More interest has been shown by the press and public than during any former exhibition; particularly interesting notices with many illustrations having appeared in the *Tribune*, the *Herald*, *Harper's Weekly*, and the *Art Interchange*, and the attendance has been as large as at any of the contemporary exhibitions of paintings, which is saying a great deal.

In regard to the present status in the real-estate and building world our hopes are being realized, with great satisfaction to those whose special efforts have been in the line of dwellings, apartments, etc., and there are a few buildings of more than ordinary importance under way, notably the large apartment house designed by Messrs. Boring & Tilton, to be erected on 43d Street. This building will be unique in many ways. It is planned primarily as a woman's apartment house, a field which bachelors have considered heretofore their own. A unique feature of this building will be a chapel in the center, an innovation which might be of use to bachelors.

Another new building is the hotel designed by Messrs. Barney & Chapman, which is now being erected on 38th Street, corner of Seventh Avenue. It is a ten-story, fire-proof structure, faced with brick and terra-cotta. It is designed in French Renaissance, and promises to be a most successful building artistically.

The city is gradually being worked up into a frenzy of excitement over the attempt of the trolley companies to grab Amsterdam Avenue, one of our finest thoroughfares, for their own uses, and to place four tracks on it. There have been protests from all the residents, owing to the great danger which would surely follow the consummation of such an act, and a bill has been introduced in the State legislature, which if passed, as seems likely at this writing, will prevent such vandalism.

Among the more interesting items of new work are: J. B. Snook & Sons have planned an eight-story store and office building, to be erected corner of Broadway and Warren Street, to take the place of the Rogers, Peet & Co. building which was destroyed by fire. It is to cost $150,000. C. P. H. Gilbert is at work on plans for an elaborate residence to be built for Mr. F. W. Woolworth on the corner of 80th Street and Fifth Avenue. It will be semi-fire-proof and faced with brick and stone; cost, about $90,000. G. Kramer Thompson has planned a seven-story steel construction warehouse, with brick and stone exterior, to be built on 42d Street, near Sixth Avenue; cost, $100,000. Stein, Cohen & Roth have planned a ten-story apartment to be built corner of 70th Street and Central Park, West. It will be of brick and terra-cotta, and cost about $700,000. John Hauser has planned seven five-story brick and stone flat buildings, to be erected on Seventh Avenue, between 140th and 141st Streets; cost, $300,000. Ralph S. Townsend has prepared plans for an eight-story store and loft building, to be

TERRA-COTTA FIGURE.
Executed by the Northwestern Terra-Cotta Company.

erected on 51st Street. It will be built of light brick, Indiana limestone, terra-cotta, and granite, and cost $60,000. Henry Anderson is at work on plans for six five-story brick dwellings, to be built on 95th Street, near Madison Avenue; cost, $104,000. A. H. Taylor has planned five three-story brick and terra-cotta dwellings, to be built on 118th Street, near Seventh Avenue; cost, $85,000. J. B. Snook & Sons have planned an eight-story brick and stone office building, to be built on Maiden Lane, near Broadway; cost, $50,000. Ralph S. Townsend has prepared plans for an eight-story brick store and loft building, to be built on Bond Street near Broadway; cost, $60,000. De Lemos & Cordes are planning an extension to the Siegel-Cooper Building at 18th Street and Sixth Avenue. It will be six stories in height, and will cost $100,000. W. Wheeler Smith is preparing plans for a four-story brick and stone dwelling, to be built on 53d Street; cost, $200,000. Lord, Hewlett & Hull are the successful competitors for the proposed hotel building, to be erected by the Astor Estate at the corner of 130th Street and Lenox Avenue. The approximate cost will be $200,000. The other competitors were Hoppin & Koen and Whitney Warren. Clinton & Russell are preparing plans for a twelve-story fire-proof office building to be built on the site of the present Chesebrough Building. The cost will be about $750,000.

HOUSE AT THOMPSON, CONN., FOR NORMAN B. REAN, ESQ., OF CHICAGO, ILL.
Shepley, Rutan & Coolidge, Architects.

PITTSBURGH.—Almost every architect's office here seems to have an unusually large amount of work on the boards, and if it should all be carried out our expectations for a busy year would certainly be realized.

The annual agitation for the widening of Diamond Street and for the removal of "the hump" on Fifth Avenue above Smithfield Street has been renewed. That Diamond Street, or alley, as it is often appropriately called, should be widened, no one doubts; it would open up for business purposes a large tract in the heart of the city which at present is given up to old shanties, which are mere fire-traps, and a menace to this part of the city. The removal of "the hump" on Fifth Avenue will be a great improvement, if enough is taken off to make an appreciable difference, but if, as seems now likely, but 8 or 10 ft. are removed, the difference in grade would hardly be noticeable. Most of the modern buildings here have been built with this in view, however, — notably the Allegheny County Court House and the Carnegie Office Building, — so that it is only the older buildings which will suffer.

TERRA-COTTA DETAIL, HOUSES, TIOGA STREET, PHILADELPHIA.
Executed by the Conkling-Armstrong Terra-Cotta Company.
Edgar V. Seeler, Architect.

Most, if not all, of the schemes for new office buildings which were talked of earlier in the year have been abandoned for the present. A number of small apartment houses are being built, but as yet there is hardly to be found here what would in any other city be considered a first-class apartment building. There is scarcely a fire-proof building among them. It seems as if only those with small capital are attracted to this kind of an investment, and that those who could put up larger and more expensive buildings are either seeking better investments or are not interested in building operations.

The following items of building news have been noted: Edward J. Carlisle & Co. have prepared plans for a fourteen-room school building at Braddock; cost, $60,000. They are also at work on the Sterrett sub-district school building; cost, $100,000. Rutan & Russell are preparing plans for the Church of St. Augustine. U. J. L. Peoples is planning a new school for the eighteenth ward; cost, $100,000. S. F. Heckert has planned a new building for St. Joseph's Academy, at Wheeling,

TERRA-COTTA PANEL.
Executed by the New York Architectural Terra-Cotta Company.

W. Va., and is at work on a new academy building at Gallitzin, Pa. T. E. Billquist has let the contract for a new residence at Sewickley. Alden & Harlow are at work on plans for four houses to be built at Homestead by the Carnegie Steel Company. The contract has just been let for a new residence on Fifth Avenue, East End, to cost $100,000. A Pittsburgh paper described it as being built of "Roman sized Pompeian brick." A New York firm are the architects.

The Pittsburgh & Lake Erie Railroad will soon commence work on a new depot, to be built on the South Side. They will spend some $300,000 on the building, not counting the train sheds, but unfortunately have decided not to employ an architect, but to allow their engineers to make the plans. So we may expect another of our engineers' buildings, which are always structurally safe, but rarely good to look at. A new high-school building is to be built at McKeesport, to cost $100,000.

MINNEAPOLIS AND ST. PAUL. — Prospects in the Twin Cities for 1899 give promise of being ahead of any of the past ten years, which means much or little, as one views it. There will be an unusual amount of residence building, the bulk of which will be done without the assistance of the architectural profession. Much as this is to be regretted, there is no apparent remedy up to date.

APARTMENT HOUSES, CHICAGO.
350,000 iron mottled flashed brick, Roman shape, were used in this building; supplied by the Ohio Mining and Manufacturing Company.
Edmund R. Krause, Architect.

The Tribune Building was visited by a disastrous fire a week since, which completely gutted the structure, leaving only front and rear walls fit for further service. As the building was of "slow-burning" construction, and as it seemed to burn freely, — yes, fiercely, — there has been considerable fun poked at that form of construction. No doubt the construction prevented a much worse fire and enabled the several hundred employees who were in the building to escape without injury. The presence of a thick fire wall was all that prevented the adjoining Century Building from a similar fate.

The Boston Block, which was burned some twelve years since, was also visited a second time by fire within the past month, the damage being only slight. Electric wires are blamed for this. The fact that the roof was of fire-proof material saved the structure from a worse fate.

Minneapolis will indulge in more brick paving this year probably, the experience of the past three or four years demonstrating forcibly its superiority from every point of view. Asphalt may be all right where there is a more even temperature, but for our climate, with its range from 40 degs. below zero to 100 degs. above, and the attendant frosts, penetrating this winter to a sufficient depth to freeze some of our water mains solid, there is too much certainty of fissures from the resulting contraction and expansion to insure any form of pavement from injury. There is a prospect that brick paving will be cheaper than ever before, in addition to its other advantages.

In Minneapolis a number of interesting projects are in the air, with a goodly prospect of eventually getting down to solid ground. Among them are a new Music Hall for the various societies, for rehearsals, meetings, etc.; a new seven-story brick business building at Nicollet and 5th Streets; the completion of the city side of the new City Hall and Court House; the erection of a new Chamber of Commerce, to cost a quarter of a million dollars; extension of our post-office building to extent of $50,000; a new hospital building for Asbury M. E. Hospital, to cost $100,000. Among architects the following: Court House at Balsam Lake, Wis., $25,000, Orff & Guilbert, architects; school building, at Wells, Minn., eight rooms, $20,000, same architects; high-school building at Salina, Kan., to cost $32,000, same architects; school building at Marshall, Minn., faced with pressed brick, cost, $35,000, W. B. Dunnell, architect; State Odd Fellows' Home, Northfield, Minn., to cost $25,000, H. W. Jones, architect; residence for F. B. Semple, at Vine Place and Franklin Avenue, to cost $50,000, Long & Son, architects; flats at Harmon Place and 12th Street, cost, $35,000, H. W. Orth, architect; flats at First Avenue and 10th Street; three double buildings, thirty flats, faced with pressed brick, cost, $50,000, E. P. Overmin, architect. The parishes of St. Mark's and St. Paul's Churches have united, and will erect a fine modern church structure in another year, on a site further out than the present St. Mark's.

In St. Paul there seems to be less projected in the line of important enterprises than in her sister city, there being some important work, however, as follows: School building, at Wheaton, Minn., seven rooms, brick and stone, cost, $15,000, Buechner & Jacobson, architects; State Normal School, at St. Cloud, Minn., addition and improvements, cost, $25,000, C. H. Johnston, architect; additions to Minnesota Club, to cost $15,000, Cass Gilbert, architect.

The City Market property has been transferred to the Library Board, who propose to transfer the property to a syndicate, which will erect a large business block thereon, and

TERRA-COTTA DETAIL.
Executed by the White Brick and Terra-Cotta Company.
Albert Wagner, Architect.

in another part of the city a magnificent Public Library building, to cost $500,000.

MANUFACTURERS' CATALOGUES AND SAMPLES DESIRED.

THE following-named architects would be pleased to receive manufacturers' catalogues and samples: M. R. Burrowes, Sarnia, Ontario; W. G. Eckles, Citizens' Bank Block, New Castle, Pa.; E. G. Worden, Board of Trade Building, Scranton, Pa.; Wiskocil & Co., 107 Wisconsin Street, Milwaukee, Wis.; John Kiewit, Jr., New York Life Building, Omaha, Neb.

CURRENT ITEMS OF INTEREST.

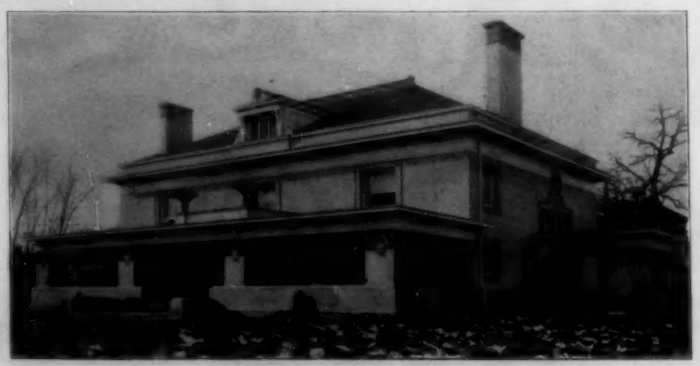
WALDO BROS. are supplying Atlas Portland cement to McNeil Bros. at Hotel Bellevue, Beacon Street, Boston.

THE ILLINOIS SUPPLY AND CONSTRUCTION COMPANY is adding new machinery to make ornamental brick.

AN ENGLISH MANOR HOUSE.

THE following-named buildings are being fireproofed by the Boston Fire-Proofing Company: Lynn Library, Lynn, Mass., George A. Moore, architect; East Boston High School, John Lyman Faxon, architect; Dorchester High School, Boston, Hartwell, Richardson & Driver, architects; South Boston High School, Herbert D. Hale, architect; extension to Adams House, Boston, William Whitney Lewis, architect; new "Proctor" and South Street buildings, Boston, Winslow, Wetherell & Bigelow, architects; Hotel Bellevue, Boston, Peabody & Stearns, architects.

LABORATORY AND GYMNASIUM BUILDING FOR ACADEMY AT SOUTH BRAINTREE, MASS.
Hartwell, Richardson & Driver, Architects.



RESIDENCE AT OAK PARK, CHICAGO.
Built of Kittanning Roman gray brick.
George W. Maher, Architect.

WALDO BROS., agents for Perth Amboy Terra-Cotta Company, have secured the contract for new building, South and Essex Streets, Boston; Winslow, Wetherell & Bigelow, architects.

THE HAUNCHWOOD BRICK AND TILE COMPANY, England, is installing a Grath Gas and Coking Furnace; W. P. Grath, inventor, St. Louis, Mo.

WALDO BROS. have been awarded the contract for Portland cement by the government at Fort Warren, Atlas having the preference over several other brands.

THE ST. LOUIS TERRA-COTTA COMPANY will supply the architectural terra-cotta for the new build-

ing for the Frankel Improvement Company at Des Moines, Iowa; Liebbe, Nourse & Rasmussen, architects.

THE DAGUS CLAY MANUFACTURING COMPANY will supply 150,000 of their buff bricks for the new high-school building at Mt. Vernon, N. Y.; also 200,000 for a new building at Crosby, Pa.; and their flashed Roman tile for a new residence at Pittsburgh, Pa.

THE contract for front brick for the new Chesebrough Building, Pearl, State, and Bridge Streets, New York City, Clinton & Russell, architects, has been awarded to the Powhatan Clay Manufacturing Company.

THE architect of the new office building at Newport News, Va., reported in our February number, was stated to be H. W. Silsby. This was an error, Mr. Silsby being the owner and J. Wyley Anderson the architect.

SAMUEL CABOT is mailing to architects a large plate of the new Southern Terminal Station, at Boston, from a negative by Soderholtz, advertising the fact that 62,000 sq. ft. of Cabot's Insulating Quilt was used in the station for insulating the heating and ventilating ducts. The quilt was specified by Prof. S. Homer Woodbridge, who has used it many times before.

PANEL FOR PLUM BUILDING, NEWARK, N. J.
Executed by the Standard Terra-Cotta Company.
Thomas Cressey, Architect.

THE following contracts have been closed for the roofing tile

TERRA-COTTA DETAIL, HOUSES, TIOGA STREET, PHILADELPHIA.
Executed by the Conkling-Armstrong Terra-Cotta Company.
Edgar V. Seeler, Architect.

manufactured by the Celadon Terra-Cotta Company, Ltd., by their Boston agent, Charles Bacon: Beaconsfield Terrace, Brookline, Mass. (10 in. red Conosera tile), S. Butterworth, architect; pumping station, Spot Pond, Stoneham, Mass. (10 in. red Conosera tile), Shepley, Rutan & Coolidge, architects.

WITHIN the last month, Charles Bacon, Boston representative of Sayre & Fisher Company, has placed contracts for nearly 700,000 bricks, viz.: South Boston High School, Herbert D. Hale, architect; Hotel Bellevue, Boston, Peabody & Stearns, architects; Spot Pond Pumping Station, Stoneham, Mass., Shepley, Rutan & Coolidge, architects; church interior, Lenox, Mass., Peabody & Stearns, architects; high school, Brookline, Mass., J. A. Schweinfurth, architect.

THE WHITE BRICK AND TERRA-COTTA COMPANY will supply the architectural terra-cotta on the following new contracts: Apartments, 83 Washington Place, New York, Quinby & Broome, architects; stores and lofts, Broadway and Canal Street, New York, Jordan & Giller, architects; school, East Orange, N. J., Boring & Tilton, architects; apartments, 85th Street and Riverside Drive, Henry Anderson, architect; residence, Westbury, L. I., Wallace & Gage, architects.

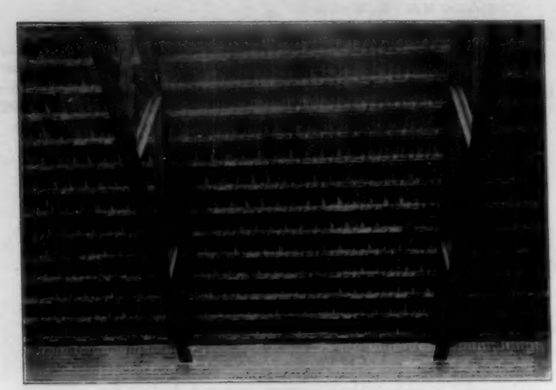
THE POWHATAN CLAY MANUFACTURING COMPANY, Richmond, Va., will hereafter occupy the commodious offices, Nos. 507–8 Townsend Building. The persistent efforts of this company have met with unprecedented success during the past season, and, taking into consideration that this was an "off" year, the record of their cream-white brick being used in fully 80 per cent. of the operations in which that class of brick was specified, is one of which the officers of the company can well be proud. Their gray brick is coming to be well known and liked by architects and contractors generally for its purity of color and general excellence, and has already been used in apartments and dwellings in the best portions of the city, although practically introduced only last year. Mr. Sol. Rosenbaum, second vice-president of the company and manager of the New York office, has been indefatigable in his efforts to place the product of the company at the top, and has certainly met with an unqualified success. Mr. H. K. Terry, vice-president and general manager, is in charge of the company's factory, and the perfection of the brick in regard to color and workmanship, and the prompt manner in which deliveries are made, prove that the management of this concern is in excellent hands. Noteworthy instances where the brick manufactured by this company have been used are the Chesebrough Building, Pearl and State Streets; the apartments at 79th Street and Amsterdam Avenue; The Livingston, at 86th Street and Central Park, West; the stores and lofts, 580 to 590 Broadway; the Powhatan and Tecumseh Apartments, 34th Street, near Seventh Avenue; Christ English Evangelical Lutheran Church, Brooklyn; the Hammerstein Company's new theater; The Victoria, 42d Street and Seventh Avenue, and a hundred other representative buildings. — *Record and Guide.*

THE LUDOWICI ROOFING TILE COMPANY has been conspicuously successful in its introduction in this country of the German system of interlocking roofing tiles. In the older European countries where roofing tiles have been for many years so perfectly made and so generally used, the more primitive patterns requiring cement in

CITY ELECTRIC LIGHT STATION, CHICAGO, ILL.
Adolph Finkler, Architect.

their joints or the long shingle lap have been superseded by the modern effective interlocking systems.

The use of nails in fastening a brittle material to structures where slight motion is possible, and dependence on perishable



INTERIOR VIEW OF ROOF, CITY ELECTRIC LIGHT STATION, CHICAGO, ILL.

cement for joints in an otherwise imperishable roofing material, are radical defects, which are definitely avoided by the Ludowici system.

Beside the highest class of glazed ware for expensive work, the Ludowici Company offers equally durable interlocking tiles at prices so low that they are extensively adopted for factories and warehouses. Laid directly on iron purlins without sheathing or book tiles, their T–1 pattern affords thus a light, fire-proof, effective, and durable roof, and one which for ultimate economy is in advance of all else. The Carnegie Company, Illinois Steel Company, McCormick Company, Deere & Co., of Moline, Ill., are using Ludowici tiles on their manufacturing buildings, and *not* for *esthetic reasons*. Those who appreciate substantial construction, and can afford to be *truly economical*, will be interested in looking into this.

The accompanying illustrations of this use of tiles show them over dynamos where they have been in place four years. There is *no drip* of *condensation* from the Ludowici tiles. This most desirable feature is due to the fact that the Ludowici tiles are never vitrified, a condition in roofing tiles to which this company is unalterably opposed. The durability of properly made roofing tiles, hard burned, but not vitrified, they have established beyond question.

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A COUPLE OF STRICTLY FIRST-CLASS DRAUGHTSMEN; ONE GOOD DESIGNER AND THOROUGHLY COMPETENT IN DETAIL WORK FOR ALL CLASSES OF BUILDINGS, AND THE OTHER A GOOD FREE-HAND SKETCHER AND DESIGNER IN RESIDENCE WORK. STATE SALARY EXPECTED. ADDRESS, W. J. KEITH, LUMBER EXCHANGE, MINNEAPOLIS, MINN.

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Lesley & Trinkle, 22 and 24 So. 15th St., Philadelphia xxx
New York & Rosendale Cement Company, 280 Broadway, New York City . xxx
New England Agents, Van Name & Co., Hartford, Conn.
James C. Goff, 31-49 Point St., Providence, R. I.
The J. S. Noble Co., 208 Lyman St., Springfield, Mass.
Lord Bros. & Co., Portland, Me.

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CLAY AND CEMENT SCREENS.
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The Robert Aitchison Perforated Metal Co., 265 Dearborn St., Chicago, Ill. . xxxiv

CLAY MANUFACTURERS' AGENTS. Brick (Front Enameled and Ornamental), Terra-Cotta, Architectural Faience, Fire-proofing, and Roofing Tiles.
Black, John H., 33 Erie Co. Savings Bk. Bldg., Buffalo, N. Y. xix
Burgy & McNeill, 531 Wood St., Pittsburgh, Pa. xix
Illinois Supply and Construction Co., St. Louis, Mo. xii
Ketcham, O. W., Builders' Exchange, Philadelphia iii
Mayland, H. F., 287 Fourth Ave., New York City iii
Meeker, Carter & Booraem, 14 E. 23d St., New York City xviii
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Central Fireproofing Co., 874 Broadway, New York xxv
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New York Agent, F. L. Douglass, St. James Building, 26th St. and Broadway.
Boston Agent, James D. Lazell, 443 Tremont Bldg.
Fiske, Homes & Co., 164 Devonshire St., Boston x
Gladding, McBean & Co., San Francisco, Cal. ii
Guastavino, R., 9 East 59th St., New York xix
Boston Office, 19 Milk Street.
Maurer, Henry, & Son, 420 E. 23d St., New York City xxiii
New York & New Jersey Fire-proofing Company, 156 Fifth Ave., New York City xxi
Pioneer Fire-proof Construction Co., 1515 Marquette Building, Chicago . . xxi
Pittsburgh Terra-Cotta Lumber Company, Carnegie Building, Pittsburgh, Pa. . xxii
New York Office, Townsend Building, Broadway and 25th Street.
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The Robert Aitchison Perforated Metal Co., 265 Dearborn St., Chicago, Ill. . xxxiv

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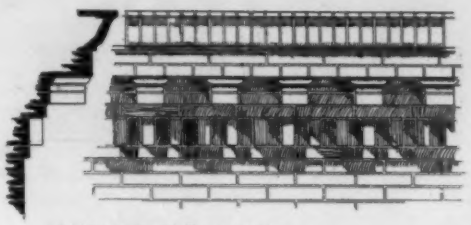
100 Park Place, New York.
The Bolles Sash Co., 150 Nassau St., New York xxxiii

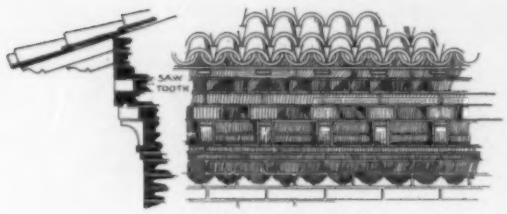
DETAILS OF ITALIAN BRICKWORK

MEASVRED AND DRAWN BY WILL S. ALDRICH

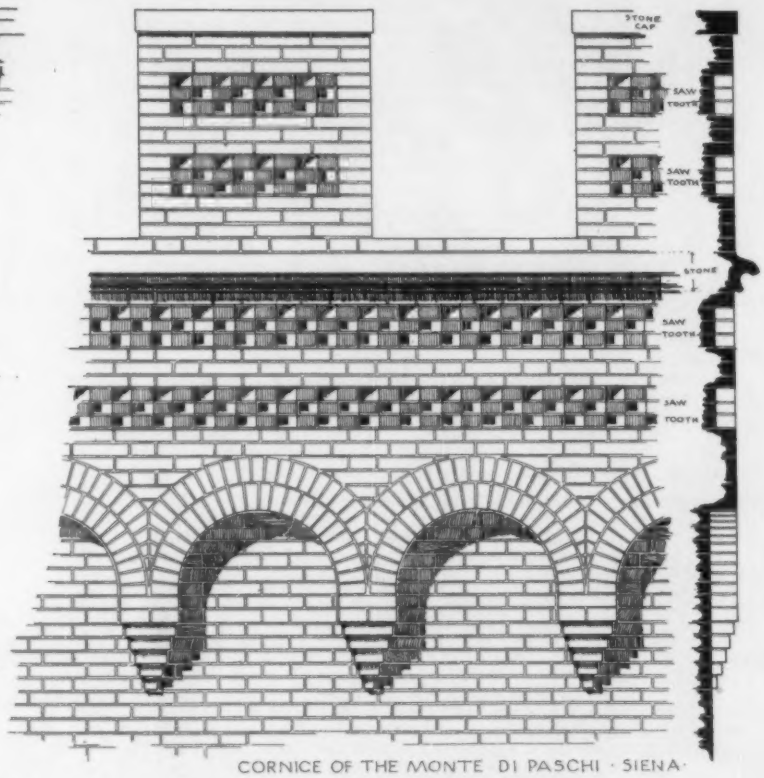
CORNICES



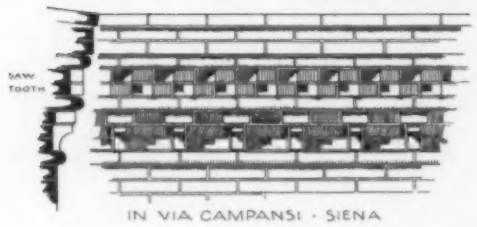
IN VIA CAVOVR · SIENA ·



· SIENA ·



CORNICE OF THE MONTE DI PASCHI · SIENA ·



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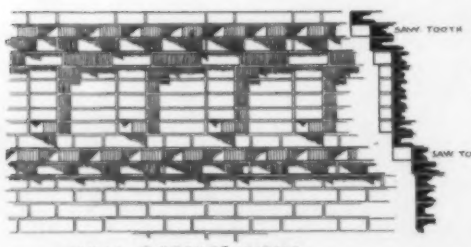
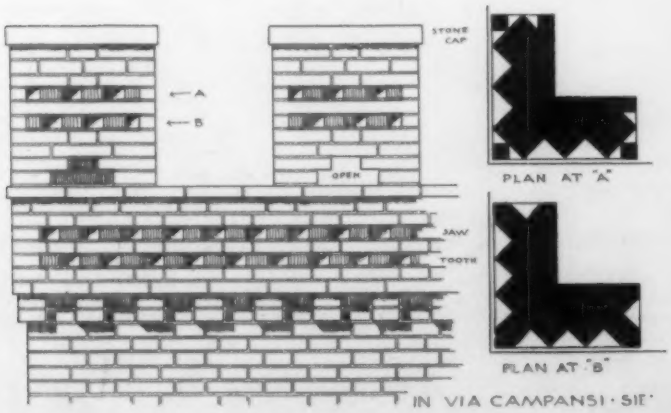


WALL CORNICE · SIENA ·



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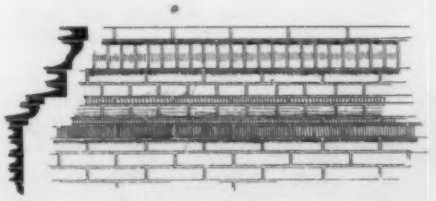
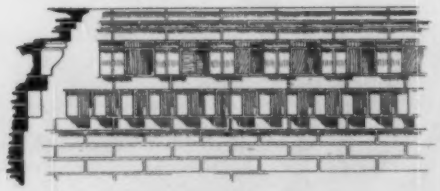
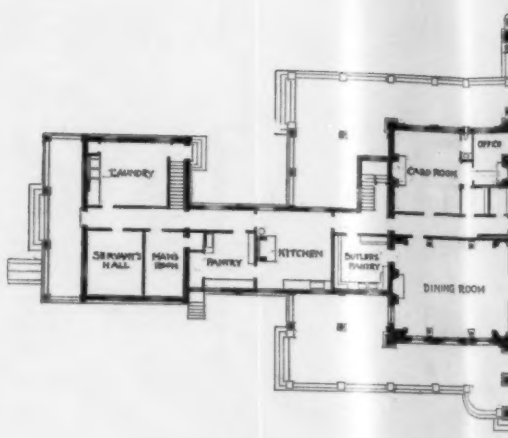


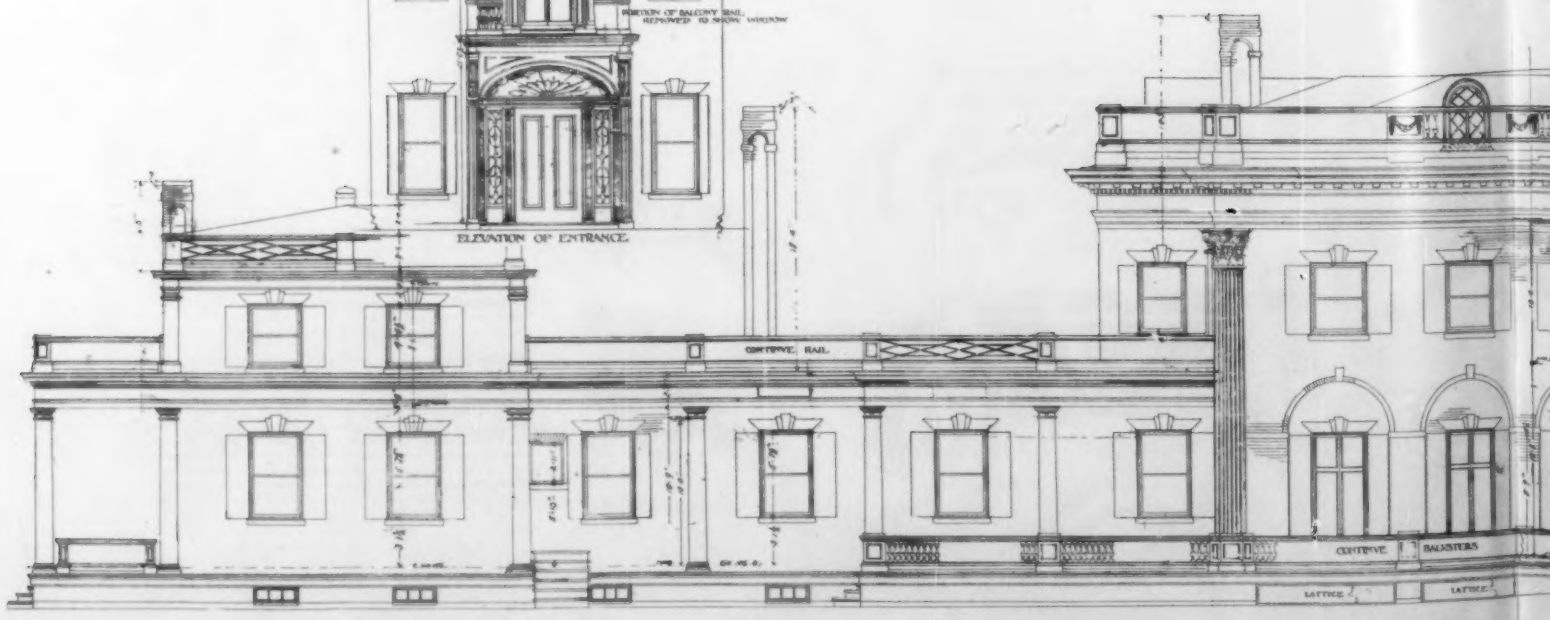


TWO SIMPLE CORNICES
FROM S·SPIRITO · SIENA

NORTH ELEVATION.



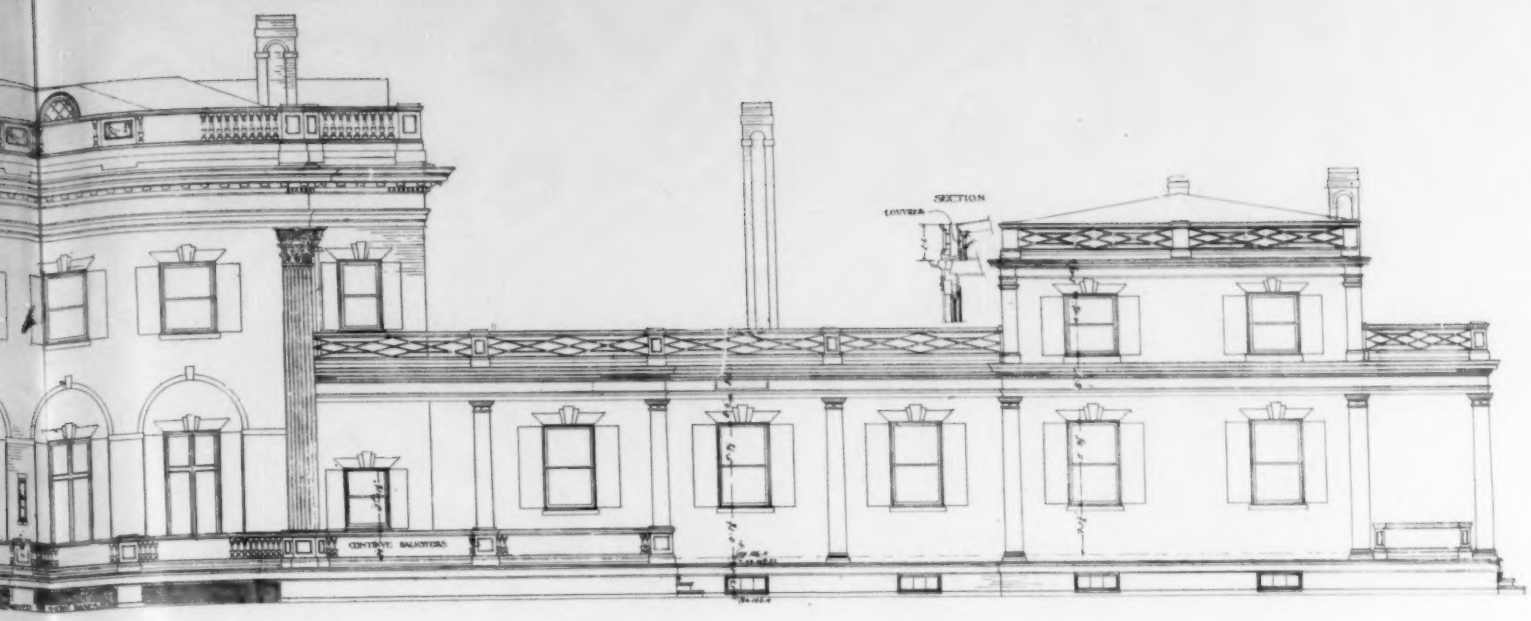
FIRST FLOOR PLA



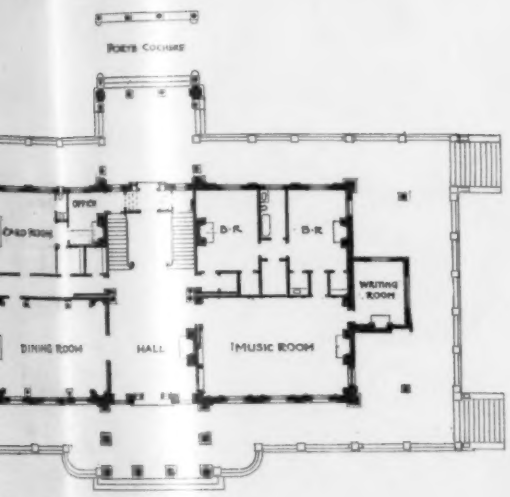
SOUTH ELEVATIO

HOUSE AT THOMPSON, CONN., FOR NORMAN

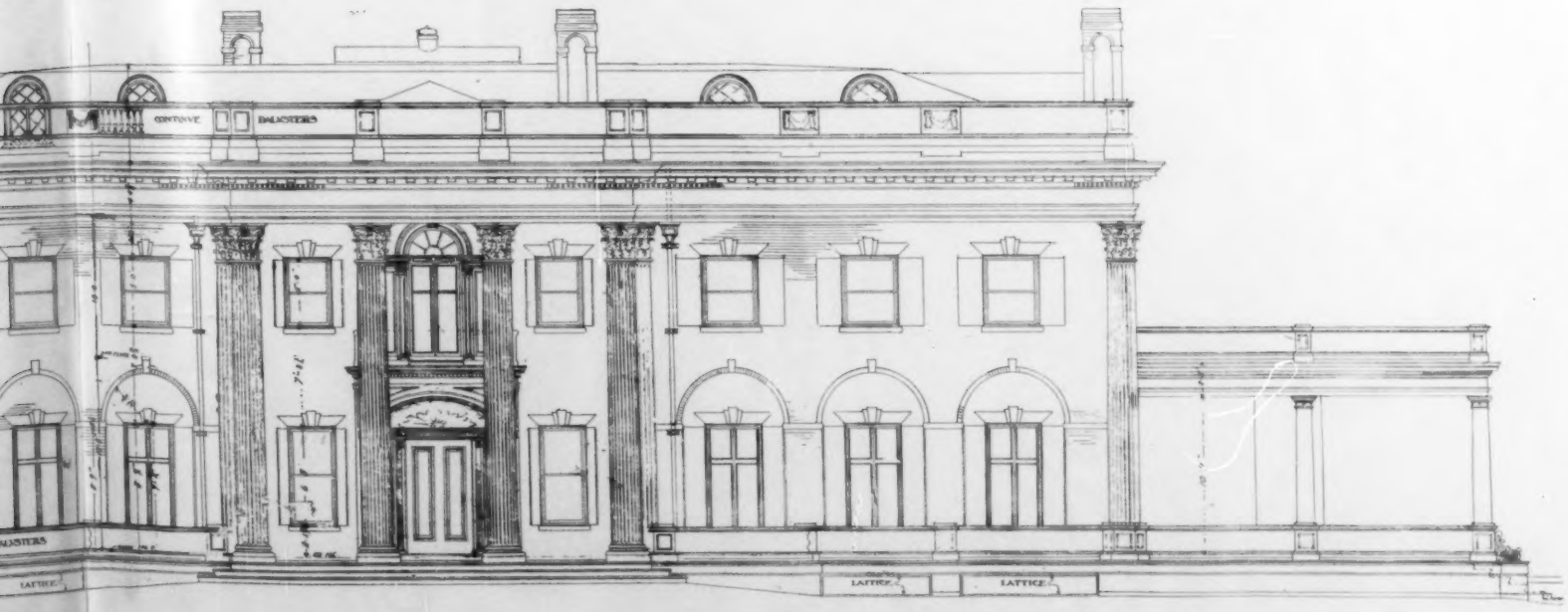
SHEPLEY, RUTAN & COOLIDG



ORTH ELEVATION.



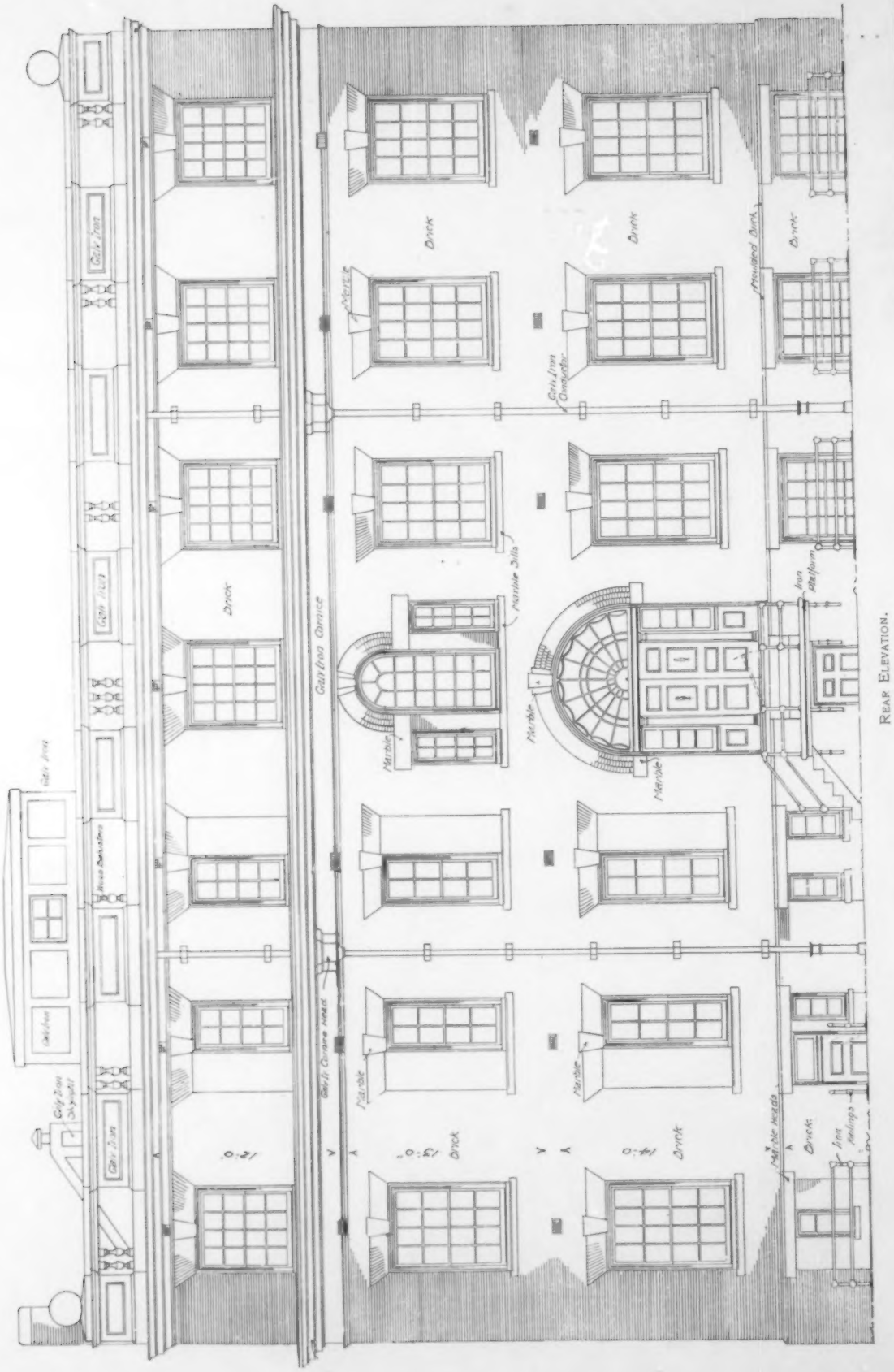
FIRST FLOOR PLAN.



SOUTH ELEVATION.

OR NORMAN B. REAN, ESQ., OF CHICAGO, ILL.

TAN & COOLIDGE, ARCHITECTS.


Brick
Marble
Gas Iron
Gas Pipe
Marble Sills
Iron Railings
Brick
Marble
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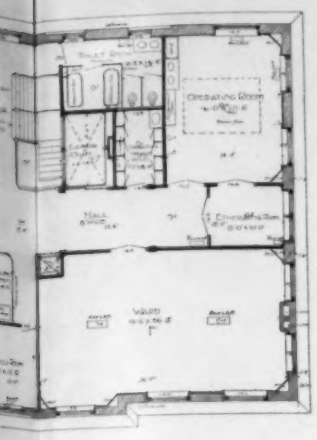
Brick
Iron Railings
Marble
Gas Iron
Gas Pipe Service
Gas Iron
Gas Iron
Gas Iron



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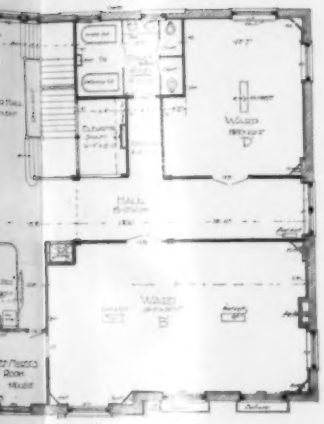

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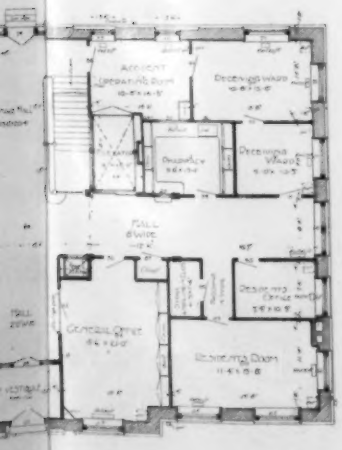

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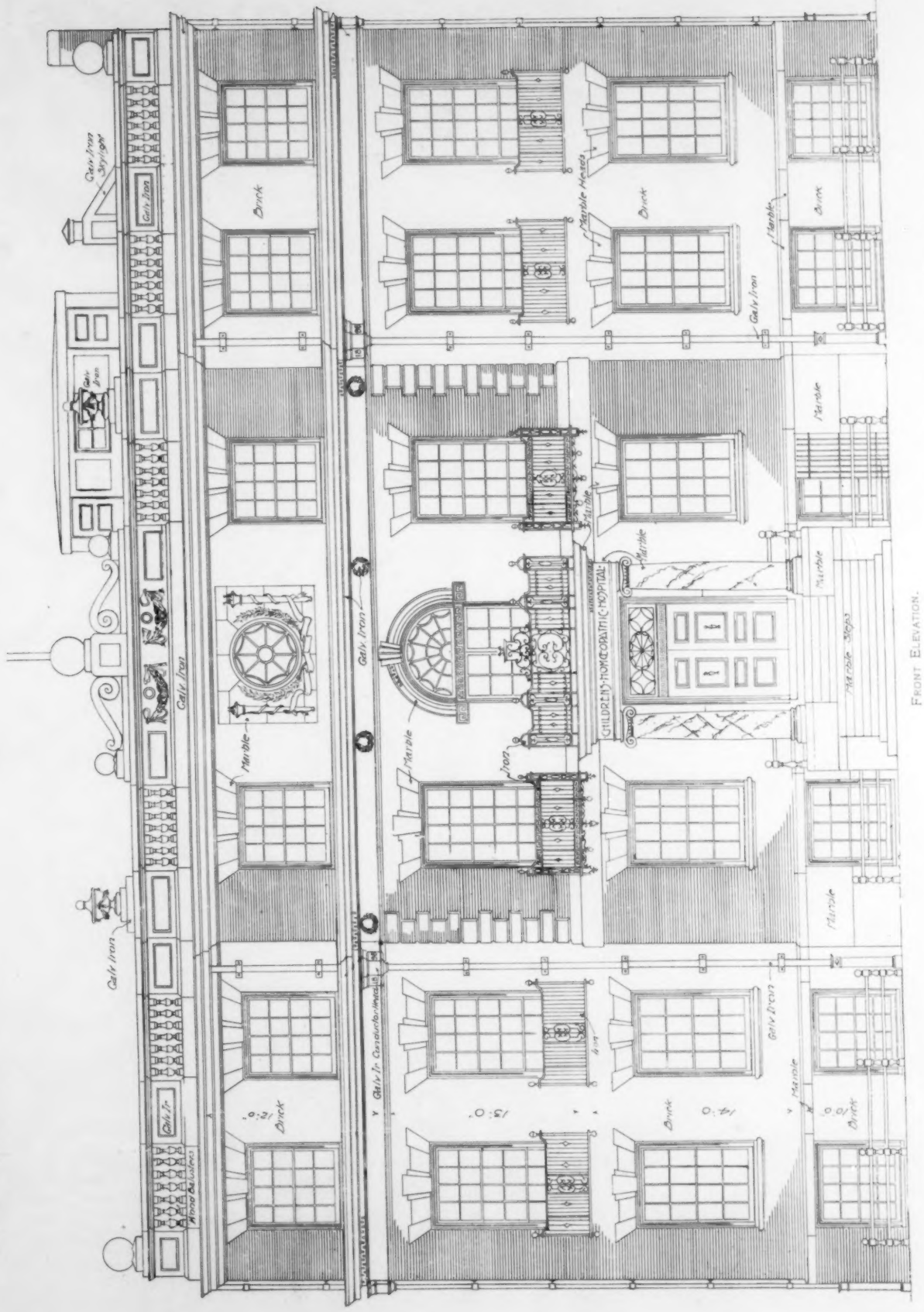
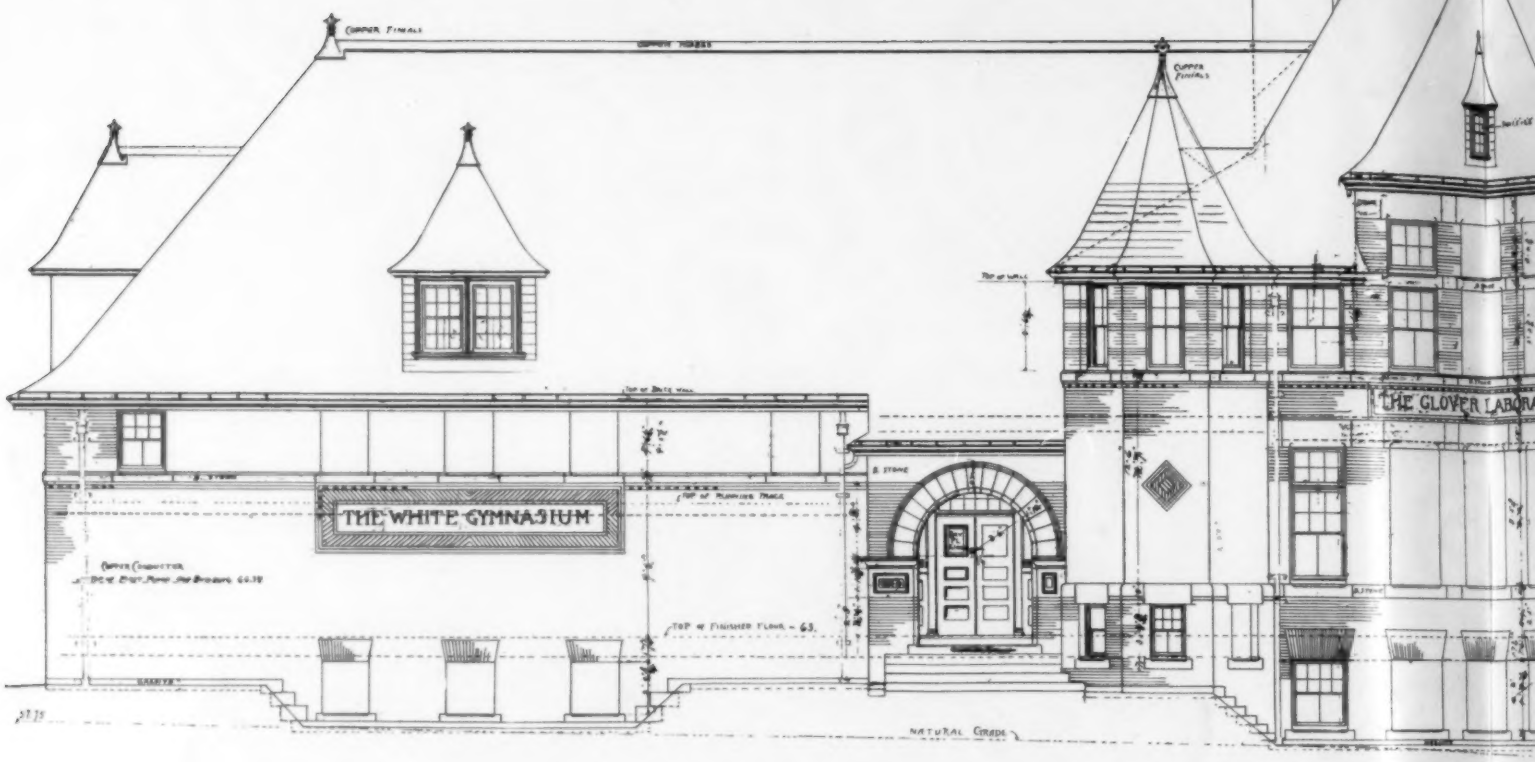
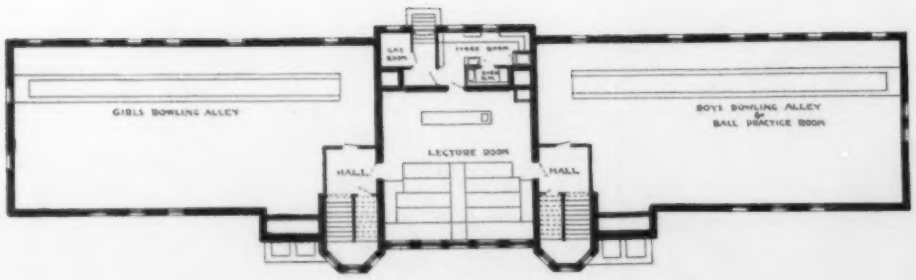


FRONT ELEVATION.

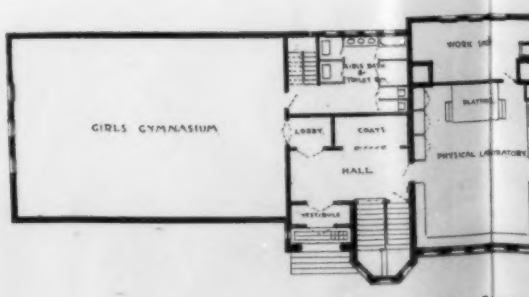
ADMINISTRATION BUILDING OF THE CHILDREN'S HOMEOPATHIC HOSPITAL, PHILADELPHIA, PA.

KEEN & MEAD, ARCHITECTS.



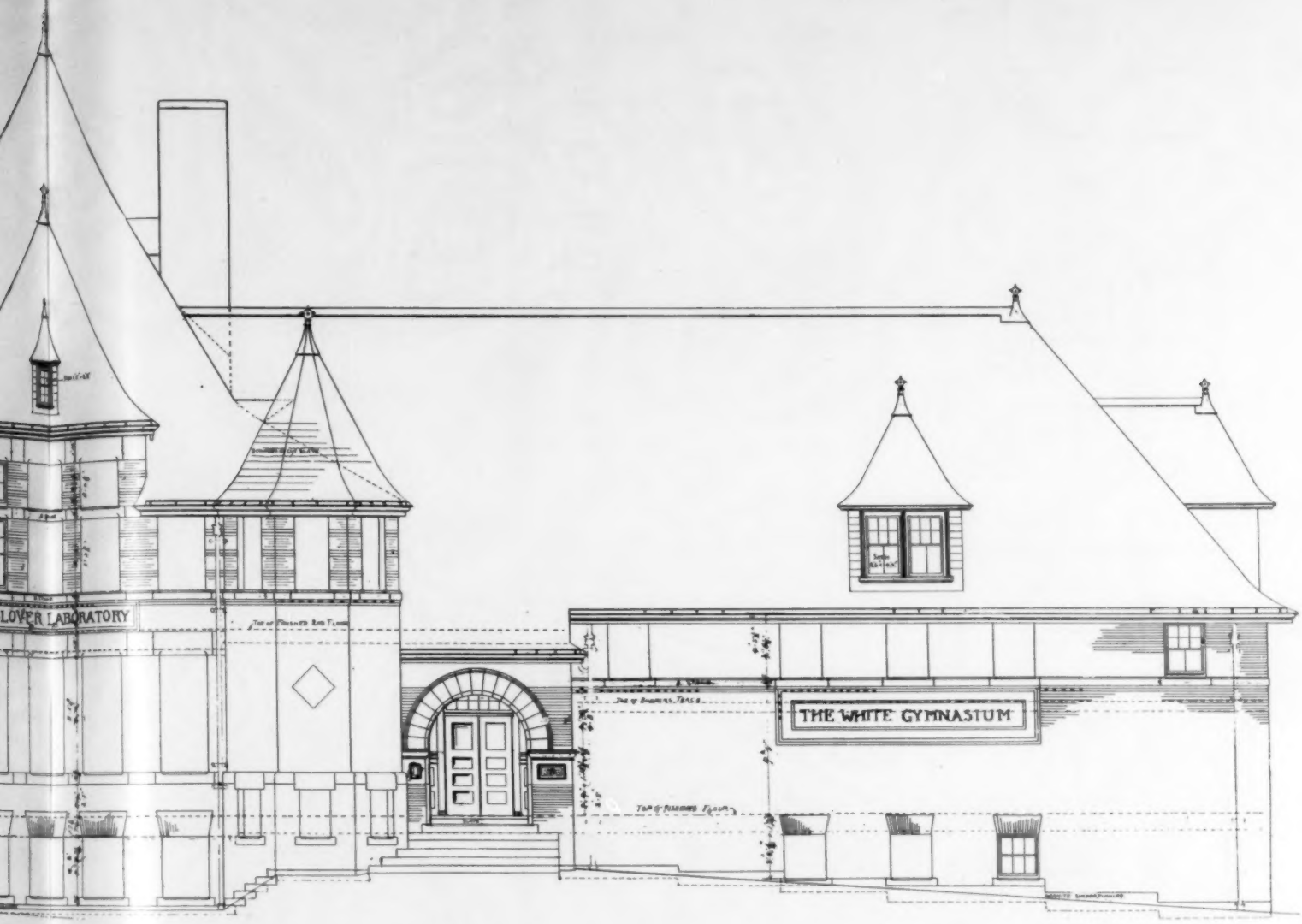


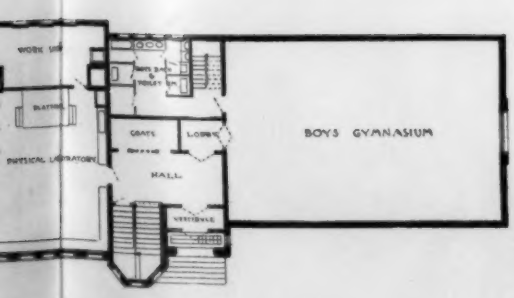
BASEMENT.



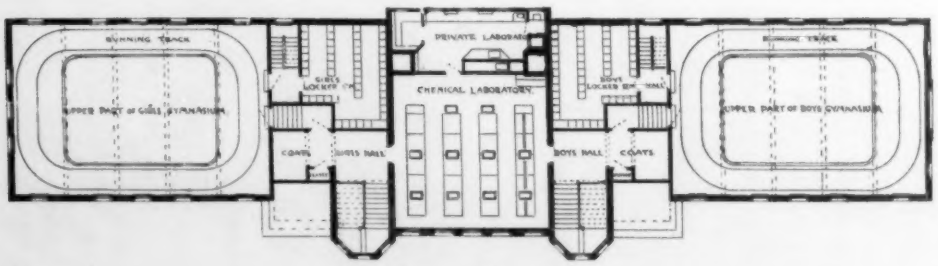
FIRST FLOOR.

LABORATORY AND GYMNASIUM BUILDING FOR
HARTWELL, RICHARDSON &





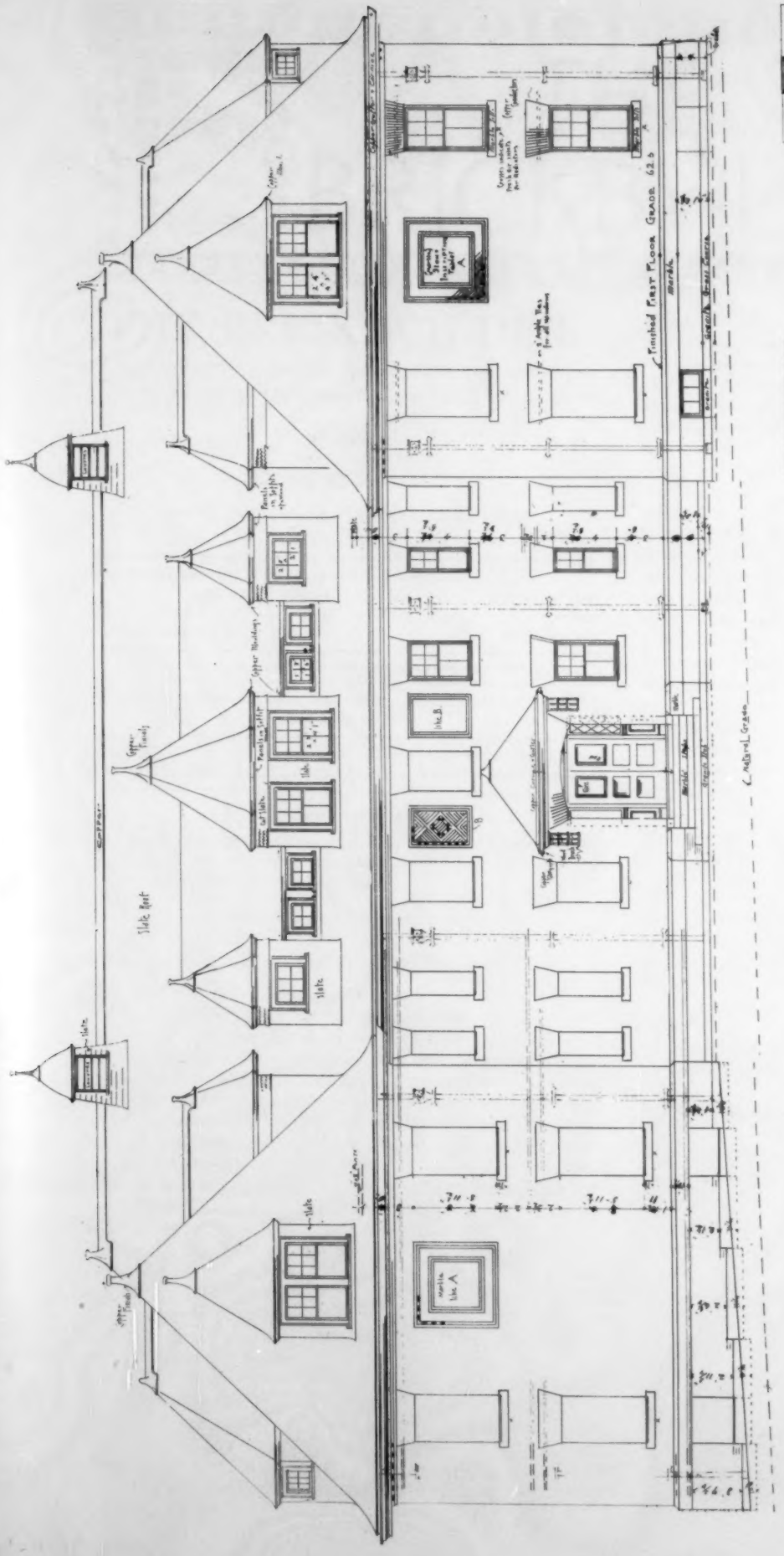
First Floor.

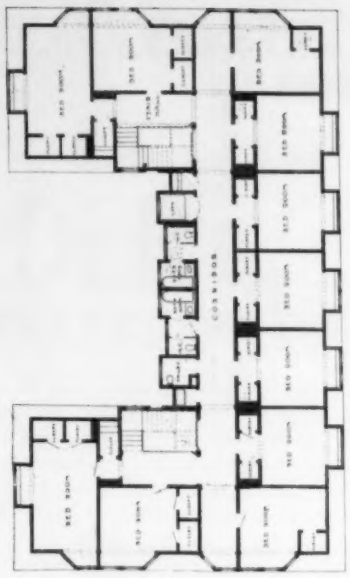


Second Floor.

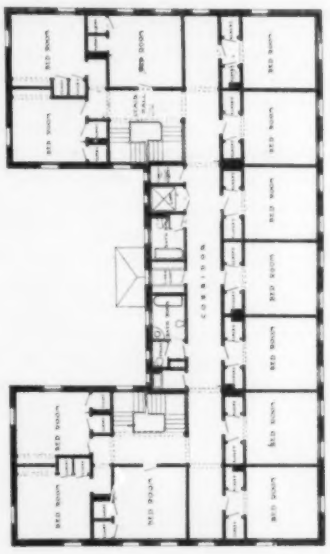
DING FOR ACADEMY AT SOUTH BRAINTREE, MASS.

HARDSON & DRIVER, Architects





THIRD FLOOR.



SECOND FLOOR.

FIRST FLOOR.

DORMITORY BUILDING, STATE NORMAL SCHOOL, BRIDGEWATER, MASS.

HARTWELL, RICHARDSON & DRIVER, ARCHITECTS.